Ontario Geological Survey
Miscellaneous Paper 117

# Report of Activities 1983 Regional and Resident Geologists

edited by
C.R. Kustra

1984

Ontario

Ministry of
Natural
Resources

Hon. Alan W. Pope
Minister

John R. Sloan
Deputy Minister

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# FOREWORD

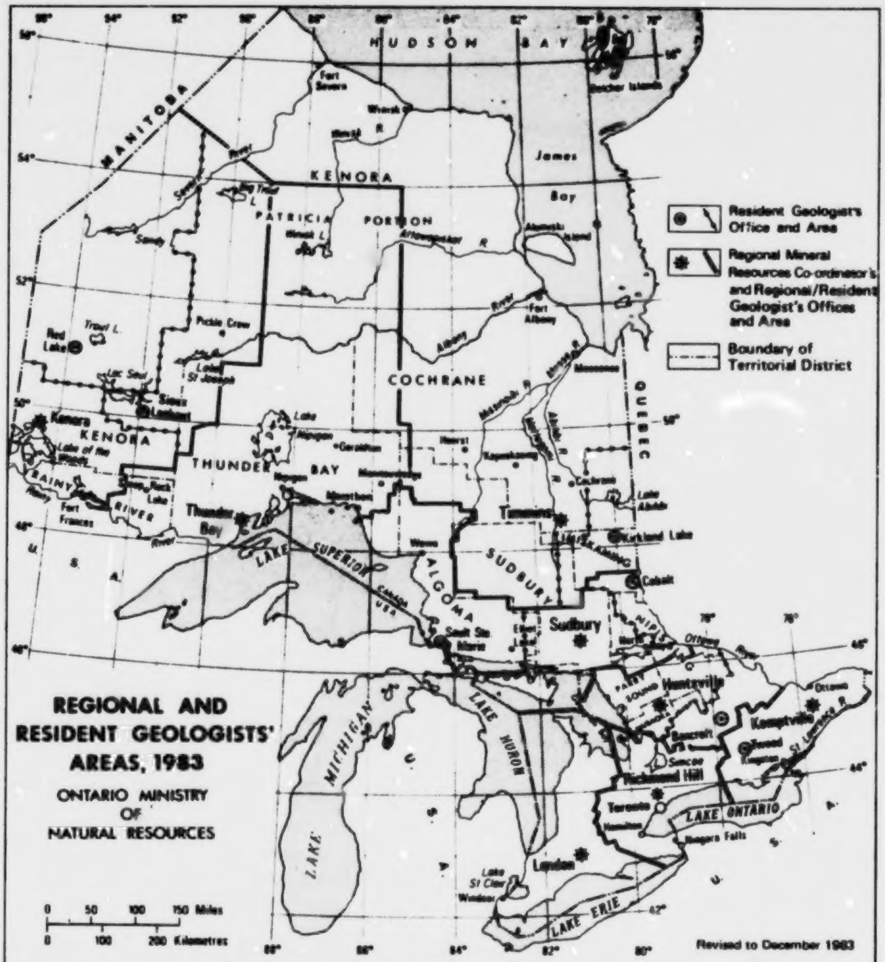
This report summarizes the activities of the Ontario Ministry of Natural Resources Regional and Resident Geologists for the period January 1, 1983, to November 30, 1983. It also includes accounts of mining and exploration activities in Ontario, prepared from information collected and filed by the Regional and Resident Geologists. Listings of new additions to the Assessment Files Records, and reports of government survey and university sponsored projects are provided.

Regional and Resident Geologists are located in key centres of the Mining Divisions of the Province, to provide geoscience information and advice to the public on the geology and mineral deposits of Ontario. Each office maintains a library of published and unpublished reports, publications of the Ontario Geological Survey and other government agencies, records of exploration activity submitted for assessment work credit, company prospectuses and reports from the files of the Ontario Securities Commission, reports of property visits made by the Regional or Resident Geologists staff, and information received directly from companies and individuals.

A marked increase in staking and exploration activity, especially for gold, occurred in 1983. Although much of this exploration took place in the Hemlo area (North Central Region), activity was widespread throughout the Regional and Resident Geologists' Areas.

All 9 Mining Divisions of the Ministry of Natural Resources reported increases in the number of claims recorded, approximately 110% over 1982. The amount of assessment work filed for credit exceeded 2.3 million days, a 36% increase over 1982.

C.R. Kustra
*Liaison Geologist*
*Ontario Geological Survey*



## REGIONAL AND RESIDENT GEOLOGISTS' AREAS, 1983

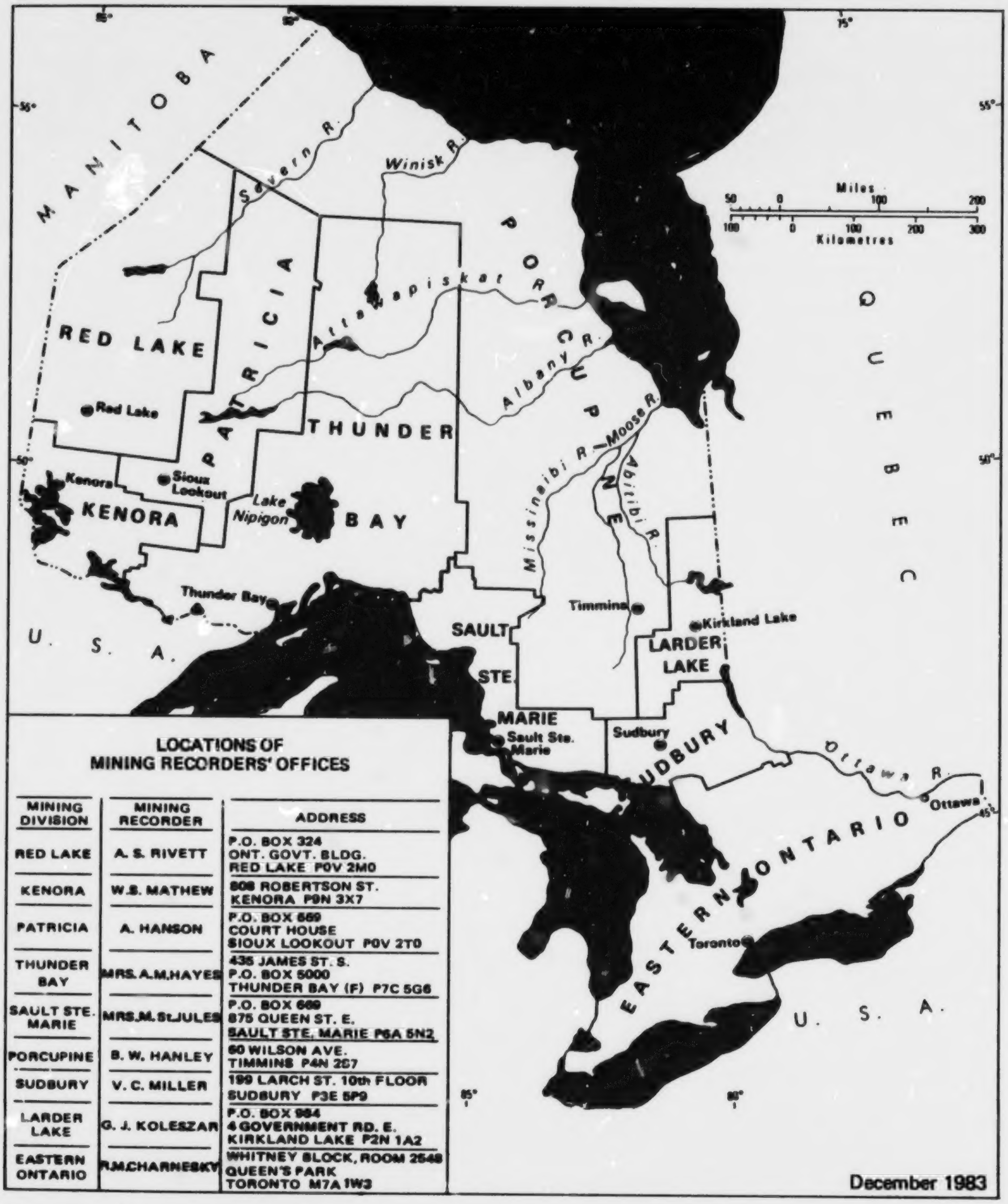
ONTARIO MINISTRY OF NATURAL RESOURCES

HUDSON BAY
James Bay
MANITOBA
QUEBEC
KENORA
PATRICIA PORTION
COCHRANE
THUNDER BAY
KENORA
RAINY RIVER
ALGOMA
SUDBURY
PARRY SOUND
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ONTARIO
LAKE ERIE
U. S. A.
Fort Severn
Winisk R.
Albany River
Attawapiskat R.
Akimiski Island
Belcher Islands
Fort Albany
Moosonee
Pickle Crow
Red Lake
Trout L.
Lac Seul
Sioux Lookout
Lake St Joseph
Kenora
Lake of the Woods
Fort Frances
Thunder Bay
Nipigon
Geraldton
Hearst
Kapuskasing
Cochrane
Timmins
Kirkland Lake
Cobalt
Lake Abitibi
Wawa
Sault Ste Marie
Sudbury
North Bay
Huntsville
Bancroft
Kemptville
Ottawa
Tweed
Kingston
Simcoe
Richmond Hill
Toronto
Hamilton
Niagara Falls
London
Windsor
Lake St Clair
St Lawrence R.
Ottawa River
Resident Geologist's Office and Area
Regional Mineral Resources Co-ordinator's and Regional/Resident Geologist's Offices and Area
Boundary of Territorial District
0 50 100 150 Miles
0 100 200 Kilometres
56°
54°
52°
50°
48°
46°
44°
42°
96°
94°
92°
90°
88°
86°
84°
82°
80°
78°
76°
74°

Revised to December 1983

| REGIONAL MINERAL RESOURCES CO-ORDINATORS' OFFICES | | | TELEPHONE | |
|---|---|---|---|---|
| **Northwestern Region** | — R.C. Beard | 808 Robertson St.,Box 5160, Kenora P9N 3X9 | (807) | 468-3111 |
| **North Central Region** | — K.G. Fenwick | 435 James St. S., Thunder Bay P7C 5G6 | (807) | 475-1331 |
| **Northern Region** | — W.O. Mackasey | 60 Wilson Ave., Timmins P4N 2S7 | (705) | 267-1401 |
| **Northeastern Region** | — P.E. Giblin | 10th fl., 199 Larch St., Sudbury P3E 5P9 | (705) | 675-4128 |
| **Algonquin Region** | — W.J. Logan | Brendale Sq., Box 9000, Huntsville P0A 1K0 | (705) | 789-9611 |
| **Eastern Region** | — T.W. Fletcher | Concession Road, Kemptville K0G 1J0 | (613) | 258-3413 |
| **Central Region** | — L.G.D. Thompson | 10670 Yonge St., Richmond Hill L4C 3C9 | (416) | 884-9203 |
| **Southwestern Region** | — P.A. Palonen | 1106 Dearness Drive, London N6E 1N9 | (519) | 681-5350 |

| REGIONAL/RESIDENT GEOLOGISTS' OFFICES | | | | |
|---|---|---|---|---|
| **Kenora** | — C.E. Blackburn | 808 Robertson St., Box 5160, Kenora P9N 3X9 | (807) | 468-3111 |
| **Red Lake** | — M.E. Durocher | Ont. Govt. Bldg. , Box 860, Red Lake P0V 2M0 | (807) | 727-2252 |
| **Sioux Lookout** | — D.A. Janes | Court House Bldg., Sioux Lookout P0V 2T0 | (807) | 737-1291 |
| **Thunder Bay** | — G.C. Patterson | 435 James St. S., Thunder Bay P7C 5G6 | (807) | 475-1331 |
| **Timmins** | — L.E. Luhta | 60 Wilson Av., Timmins P4N 2S7 | (705) | 267-1401 |
| **Kirkland Lake** | — H.L. Lovell | 4 Government Rd. E., Kirkland Lake P2N 1A2 | (705) | 567-5242 |
| **Sudbury** | — P.E. Giblin | 10th fl., 199 Larch St., Sudbury P3E 5P9 | (705) | 675-4128 |
| **Sault Ste. Marie** | — G.A. Bennett | 875 Queen St. E., Sault Ste. Marie P6A 2B3 | (705) | 949-1231 |
| **Cobalt** | — L. Owsiacki | Box 230 Presley St., Cobalt P0S 1C0 | (705) | 679-3558 |
| **Huntsville** | — D. J. Villard | Brendale Sq., Box 9000, Huntsville P0A 1K0 | (705) | 789-9611 |
| **Bancroft** | — H.D. Meyn | Hwy. 28, Box 500, Bancroft K0L 1C0 | (613) | 332-3940 |
| **Tweed** | — P.W. Kingston | 255 Metcalf St., Box 70, Tweed K0K 3J0 | (613) | 478-2330 |
| **Richmond Hill** | — M. Narain | 10670 Yonge St., Richmond Hill L4C 3C9 | (416) | 884-9203 |
| **London** | — James Lau | 458 Central Av., London N6B 2E5 | (519) | 433-8431 |



MANITOBA
Severn R.
Winisk R.
Attawapiskat R.
Albany R.
Moose R.
Missinaibi R.
Abitibi R.
Ottawa R.
RED LAKE
PATRICIA
THUNDER BAY
PORCUPINE
KENORA
SAULT STE. MARIE
LARDER LAKE
SUDBURY
EASTERN ONTARIO
QUEBEC
U. S. A.
U. S. A.
Red Lake
Kenora
Sioux Lookout
Lake Nipigon
Thunder Bay
Timmins
Kirkland Lake
Sault Ste. Marie
Sudbury
Ottawa
Toronto
Miles
50
0
100
200
100
0
100
200
300
Kilometres
95°
90°
75°
85°
80°
55°
55°
50°
50°
45°

## LOCATIONS OF MINING RECORDERS' OFFICES

| MINING DIVISION | MINING RECORDER | ADDRESS |
|---|---|---|
| RED LAKE | A. S. RIVETT | P.O. BOX 324<br>ONT. GOVT. BLDG.<br>RED LAKE P0V 2M0 |
| KENORA | W.S. MATHEW | 808 ROBERTSON ST.<br>KENORA P9N 3X7 |
| PATRICIA | A. HANSON | P.O. BOX 669<br>COURT HOUSE<br>SIOUX LOOKOUT P0V 2T0 |
| THUNDER BAY | MRS. A.M.HAYES | 435 JAMES ST. S.<br>P.O. BOX 5000<br>THUNDER BAY (F) P7C 5G6 |
| SAULT STE. MARIE | MRS.M. St.JULES | P.O. BOX 669<br>875 QUEEN ST. E.<br>SAULT STE. MARIE P6A 5N2 |
| PORCUPINE | B. W. HANLEY | 60 WILSON AVE.<br>TIMMINS P4N 2S7 |
| SUDBURY | V. C. MILLER | 199 LARCH ST. 10th FLOOR<br>SUDBURY P3E 5P9 |
| LARDER LAKE | G. J. KOLESZAR | P.O. BOX 984<br>4 GOVERNMENT RD. E.<br>KIRKLAND LAKE P2N 1A2 |
| EASTERN ONTARIO | R.M.CHARNESKY | WHITNEY BLOCK, ROOM 2548<br>QUEEN'S PARK<br>TORONTO M7A 1W3 |

December 1983

# Conversion Factors for Measurements in Ontario Geological Survey Publications

If the reader wishes to convert imperial units to SI (metric) units or SI units to imperial units the following multipliers should be used:

| **CONVERSION FROM SI TO IMPERIAL** | | | **CONVERSION FROM IMPERIAL TO SI** | | |
|---|---|---|---|---|---|
| *SI Unit* | *Multiplied by* | *Gives* | *Imperial Unit* | *Multiplied by* | *Gives* |
| | | | LENGTH | | |
| 1 mm | 0.039 37 | inches | 1 inch | **25.4** | mm |
| 1 cm | 0.393 70 | inches | 1 inch | **2.54** | cm |
| 1 m | 3.280 84 | feet | 1 foot | **0.304 8** | m |
| 1 m | 0.049 709 7 | chains | 1 chain | 20.116 8 | m |
| 1 km | 0.621 371 | miles (statute) | 1 mile (statute) | **1.609 344** | km |
| | | | AREA | | |
| 1 cm² | 0.155 0 | square inches | 1 square inch | **6.451 6** | cm² |
| 1 m² | 10.763 9 | square feet | 1 square foot | **0.092 903 04** | m² |
| 1 km² | 0.386 10 | square miles | 1 square mile | 2.589 988 | km² |
| 1 ha | 2.471 054 | acres | 1 acre | 0.404 685 6 | ha |
| | | | VOLUME | | |
| 1 cm³ | 0.061 02 | cubic inches | 1 cubic inch | **16.387 064** | cm³ |
| 1 m³ | 35.314 7 | cubic feet | 1 cubic foot | 0.028 316 85 | m³ |
| 1 m³ | 1.308 0 | cubic yards | 1 cubic yard | 0.764 555 | m³ |
| | | | CAPACITY | | |
| 1 L | 1.759 755 | pints | 1 pint | 0.568 261 | L |
| 1 L | 0.879 877 | quarts | 1 quart | 1.136 522 | L |
| 1 L | 0.219 969 | gallons | 1 gallon | **4.546 090** | L |
| | | | MASS | | |
| 1 g | 0.035 273 96 | ounces (avdp) | 1 ounce (avdp) | 28.349 523 | g |
| 1 g | 0.032 150 75 | ounces (troy) | 1 ounce (troy) | **31.103 476 8** | g |
| 1 kg | 2.204 62 | pounds (avdp) | 1 pound (avdp) | **0.453 592 37** | kg |
| 1 kg | 0.001 102 3 | tons (short) | 1 ton (short) | **907.184 74** | kg |
| 1 t | 1.102 311 | tons (short) | 1 ton (short) | **0.907 184 74** | t |
| 1 kg | 0.000 984 21 | tons (long) | 1 ton (long) | **1016.046 908 8** | kg |
| 1 t | 0.984 206 5 | tons (long) | 1 ton (long) | **1.016 046 908 8** | t |
| | | | CONCENTRATION | | |
| 1 g/t | 0.029 166 6 | ounce (troy)/ ton (short) | 1 ounce (troy)/ ton (short) | 34.285 714 2 | g/t |
| 1 g/t | 0.583 333 33 | pennyweights/ ton (short) | 1 pennyweight/ ton (short) | 1.714 285 7 | g/t |

**OTHER USEFUL CONVERSION FACTORS**

| | | |
|---|---|---|
| 1 ounce (troy)/ton (short) | 20.0 | pennyweights/ton (short) |
| 1 pennyweight/ton (short) | 0.05 | ounce (troy)/ton (short) |

NOTE—Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries published by The Mining Association of Canada in cooperation with the Coal Association of Canada.

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# Report of Activities 1983
# Kenora Resident Geologist Area, Northwestern Region

**C.E. Blackburn[1] and M.R. Hailstone[2]**

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## Introduction

The Resident Geologist's Office is staffed by C.E. Blackburn, Resident Geologist, M.R. Hailstone, Resource Geologist, and M. Guderyan, Secretary. C.C. Storey, employed under the Northern Ontario Rural Development Agreement (NORDA) incentives program, continued a Building Stone Inventory commenced in 1982, under R.C. Beard, Mineral Resources Co-ordinator, Northwestern Region. J.C. Davies and P.M. Smith, employed under the NORDA incentives program, commenced duties under the technical supervision of C.E. Blackburn, to undertake a Gold Deposit Study of Lake of the Woods. A. Anderson was employed under the Experience '83 program and under separate contract as a data processing technician.

The section in this report on the "Building, Monumental, and Decorative Stone Project" was written by C.C. Storey.

## Resident Geologist's Activities

As part of the regular field program, several properties were visited that were undergoing development work or advanced evaluation. These included the property of Union Carbide Exploration Corporation, which held an option on Consolidated Professor Mines Limited's Duport Mine gold property at Shoal Lake, the Cameron Lake gold property of Nuinsco Resources Limited and Lockwood Petroleum Incorporated, and the Olive Mine gold property optioned by Homestake Explorations Limited. Numerous other properties and areas undergoing active exploration were visited. These are the Kakagi Lake (East Group) gold occurrence, under option to Barrier Reef Resources Limited; the Starr and Peak Lake gold occurrences and surrounding area, under option to Asamera Incorporated; the Petrunka-Moorehouse tungsten property near Mavis Lake, under evaluation by Sanmine Exploration Incorporated; the Fairservice gold property near Straw Lake, currently under option to Noranda Mines Limited; the Gaudry gold prospect, being explored by Selco Incorporated as a joint venture with Gossan Resources Limited; the Monte Cristo gold prospect of Nuinsco Resources Limited and Lockwood Petroleum Incorporated; the Electrum Lake gold prospect, under option to Barrier Reef Resources Limited; Teck Corporation's Gaffney gold prospect on Manitou Island, Lower Manitou Lake; the Bonanza and Redeemer Mines and associated prospects in Van Horne Township, being explored by Van Horne Gold Exploration Incorporated; the Treasure gold prospect, dewatered by New Ambrose Resources; the Tycoon Gold prospect, diamond drilled by Tasu Resources Limited, the Gold Hill and Blackjack, and associated gold prospects in Kirkup Township, under option to Bonzano Exploration Limited; and the Sullivan Bay area of Rowan Lake, being explored by Calaveras Explorations Limited. Other prospects under evaluation, and inactive mineral showings were examined and reported on during the year.

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[1] Resident Geologist, [2] Resource Geologist, Ontario Ministry of Natural Resources, Kenora.

As part of the Ministry of Natural Resource's public information program, geoscience lectures and field trips were provided for the Rough Rock and Gellay Lake Junior Ranger camps, and for the local high school. A 2-part series of 25-hour courses, entitled "Principles of Geology" and "Mineral Exploration" were offered by C.E. Blackburn through Confederation College in Kenora.

C.E. Blackburn presented a paper co-authored with Don Janes, Resident Geologist, Sioux Lookout, at the Annual General Meeting of the Canadian Institute of Mining and Metallurgy in Winnipeg, entitled "Gold Deposits of the Western Wabigoon Subprovince, Northwestern Ontario, and their Metallogeny" (Blackburn and Janes 1983a). A companion paper, "Gold Deposits in Northwestern Ontario", by the same authors, was concurrently published in "The Geology of Gold in Ontario" (Blackburn and Janes 1983b). C.E. Blackburn and M.R. Hailstone presented a paper entitled "The Geological Environment of Gold Mineralization in the Cameron-Rowan Lakes, Northwestern Ontario" at the Ontario Geological Survey Geoscience Research Seminar, 1983. C.C. Storey presented a paper entitled "Geological Criteria for Building Stone Deposits" at the same seminar. R.C. Beard, Mineral Resources Co-ordinator, Northwestern Region, presented a paper entitled "Dimension Stone: The Overlooked Prospecting Target" at the Annual General Meeting of the Prospectors and Developers' Association in Toronto.

## Mining Activity

No metallic mineral production was recorded in 1983 from any of the mining properties in the Kenora Mining Division.

Quarrying activity in 1983 is discussed under the section on the Building, Monumental, and Decorative Stone Project.

Production of horticultural peat by Arctic Peat Moss Corporation, near Barwick, continued during 1983.

Following the termination by Selco Incorporated of its development program on the Duport Mine gold property of Consolidated Professor Mines Limited on Cameron Island, Shoal Lake, in August 1982, negotiations were made by the latter company to bring in another partner. In February 1983, it was announced (Northern Miner, February 24) that:

> *Consolidated Professor Mines has a joint venture agreement with Union Carbide Canada and Union Carbide Exploration Corp. of Danbury, Connecticut, to continue exploration and development work on Professor's Shoal Lake gold deposit near Kenora, Ontario.*
>
> *Under the agreement ... Union Carbide can earn a 50% interest in the property by eventually spending $10 000 000 in stages, and agreeing to put the property into production.*

Selco Incorporated had previously outlined drill-indicated reserves of 2 000 000 tons grading 0.30 ounce gold per ton, in 2 parallel zones, the Main Zone and the East Zone, to a depth of 1000 feet.

Over the winter, 1500 feet of drilling was carried out over 18 holes, using 2 drills, to confirm reserves and to test extension of mineralization. A 1000-pound sample was taken from the old mine dump for metallurgical testing at Union Carbide's Niagara Falls laboratories.

Following the assessment by Union Carbide, an announcement was made in June (Northern Miner, June 16, 1983) of a revised reserve estimate for the property of 1 927 000 tons at a grade of 0.30 ounce gold per ton, over an average width of 9.75 feet. The deepest drill intersection cut 0.33 ounce gold per ton over a 5.5-foot width in the Main Zone, at a depth of 1150 feet.

In October, the decision was made by Union Carbide to proceed with a $4 000 000 underground development program, in 2 phases of $2 000 000 each, to drive a 2000-foot decline from Stevens Islands to the East Zone at the 250-foot level, and secondly to go deeper and explore the Main Zone (Northern Miner, October 13, 1983). Stripping and blasting of the decline portal commenced shortly after (Northern Miner, October 17, 1983). The operations for 1983 at the site were terminated by mid-December, at a depth of 45 feet.

## Exploration Activity

The overall optimistic outlook for gold, generated by the success story at Hemlo, a greater availability of risk capital, and the rise in price of gold from the $300+ level in mid-1982 to $500 per ounce at the beginning of 1983, led to major exploration activity for gold in the Kenora Mining Division throughout 1983. The most notable exploration was in the Cameron-Rowan Lakes area, where Nuinsco Resources Limited and Lockwood Petroleum Incorporated mounted an impressive drill program throughout the summer. The year started well, with total claims staked in the Division in January and February almost reaching the level for the whole of 1982, with over 1200 staked. Over 6000 had been staked by mid-year, with the momentum continuing well into the fall. By December 1st, of the 13 500 claims active in the Division, over 10 500 had been staked in 1983. Other relatively minor activity was related to base-metal exploration, and to tungsten.

Gold exploration was notably concentrated in the Kakagi-Cameron-Rowan Lakes areas, and the Manitou Lakes through to Wabigoon and Eagle Lake areas, and in the Lake of the Woods-Shoal Lake and Mine Centre areas.

TABLE 1 SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

| Year | Claims Recorded | Claims Cancelled | Claims Active | Diamond Drilling (Man Days) | Geophysical Surveys (Man Days) | Geological Surveys (Man Days) | Total Man Days |
|---|---|---|---|---|---|---|---|
| 1983* | 10,657 | 1,200 | 13,503 | 35,452 | 28,941 | 6,706 | 78,031 |
| 1982 | 1,579 | 1,609 | 4,046 | 23,505 | 26,270 | 5,330 | 60,439 |
| 1981 | 2,121 | 846 | 4,076 | 26,127 | 37,624 | 3,383 | 72,732 |
| 1980 | 1,872 | 788 | 3,208 | 15,428 | 3,149 | 859 | 21,368 |
| 1979 | 984 | 1,357 | 2,119 | 9,992 | 10,658 | 1,420 | 24,182 |
| 1978 | 808 | 1,357 | 2,300 | 22,299 | 7,576 | 2,143 | 34,934 |
| 1977 | 1,495 | 1,585 | 2,820 | 15,405 | 11,366 | 1,760 | 33,838 |
| 1976 | 1,780 | 2,125 | 3,234 | 25,030 | 21,367 | 5,960 | 55,042 |
| 1975 | 1,677 | 2,452 | 3,975 | 13,584 | 31,509 | 940 | 57,266 |
| 1974 | 2,653 | 1,076 | 4,727 | 29,496 | 18,049 | 3,070 | 52,134 |

*to Nov. 30

TABLE 2 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

**Ontario Geological Survey Reports**

GR 201 GR 221
GR 223

**Open File Reports**

OFR 5386
OFR 5446

**Preliminary Maps - Geological Series**

P-2594
P-2595
P-2617
P-2618

**Preliminary Maps - Data Series**

-

**Aggregate Resources Publications**

ARIP - 92

**Federal - Provincial Maps**

-

**Coloured Maps**

Map 2422 Map 2430
Map 2476

**Northern Ontario Engineering Geology Terrain Studies Reports**

-

**Northern Ontario Engineering Terrain Studies Maps**

-

**Mineral Resources Branch Publications**

-

**Miscellaneous Reports**

MP - 107, MP - 110
MP - 116

**Geological Survey of Canada Open File Reports**

-

Base-metal exploration was centred on the Cliff Lake-Cedar Lake area, north of Vermilion Bay, and in the Menary Township area, south of Nestor Falls.

Exploration for tungsten continued near Mavis Lake in the Dryden area, and in the same area an exploration program for tantalum-lithium was terminated.

# Gold

## Kakagi-Rowan-Cameron Lakes Area

Nuinsco Resources Limited renewed exploration activity on its Cameron Lake gold property in 1983, following a relatively inactive period in 1982. Prior to this, Nuinsco Resources Limited had completed a 17-hole drilling program in 1981, the best hole cutting 31.6 feet of 2.32 ounces gold per ton. At the beginning of 1983, Nuinsco Resources Limited acquired, by option, 7 claims covering the Monte Cristo gold prospect at Rowan Lake and, by staking, a further 38 claims surrounding it. Lockwood Petroleum Incorporated was subsequently granted on option to acquire a 50% interest in both the Cameron Lake property and the Monte Cristo prospect by spending $1 million on exploration by the end of 1984. Diamond drilling commenced at Cameron Lake in March, and continued through to November, with 2 drill rigs operating almost continuously, and a third intermittently. A total of 58 holes were completed on the Main Zone in this time, for a total length of 56 394 feet. An additional 13 exploration holes were drilled for a length of 8834 feet. Diamond drilling on the Monte Cristo prospect at Rowan Lake totaled 5155 feet over 12 holes, from May to September. Induced polarization surveys were carried out at both properties; at the Monte Cristo, zones that were previously drilled and trenched in 1937 were delineated, in addition to new, untested zones; at Cameron Lake, surveys were conducted over a new gold-bearing zone that had previously been detected by soil sampling and prospecting. As work at Cameron Lake progressed over the summer months, numerous press releases gave news of the most recent drillholes: by mid-summer, Nuinsco Resources Limited and Lockwood Petroleum Incorporated were outlining a number of zones, referred to as the Lower Zone (or Zones), the Upper Zone (or Zones), and the Main Zone. Prior to 1983, all work had been in the Lower Zones, up-dip of the newly-discovered Upper and Main Zones. Estimates of tonnage and grade at the Cameron Lake property were of a preliminary nature only, developed as drilling proceeded. By September, the company was reporting that:"*Within the main zone, gold has been intersected from 200 feet below surface to below 800 ft. of depth, along an apparent strike length of over 1,100 feet. Fourteen holes had gold across widths in excess of 50 feet. One hole ran a weighted average of 0.204 ounce gold per ton across the entire 76.6 foot width*" (George Cross Newsletter, Number 170, September 2, 1983). Lockwood Petroleums Incorporated completed their expenditure commitment to Nuinsco Resources Limited before the end of the summer, to earn a 50% interest in the property. By October, according to the Northern Miner, October 20, 1983: "*Recent drilling has increased the strike length of 1,150 ft., and the down-plunge of the deposit is now in excess of 1,600 ft.*" The December 1st issue of the Northern Miner reported that the final 2 holes of the 1983 season had "encountered what appears to be a new zone more than 400 ft. down dip from any previous intersection", with grades running about 0.2 ounce gold per ton across a 16-foot intersection.

Barrier Reef Resources Limited took an option in early winter on the Kakagi Lake (East Group) and Martin gold occurrences, at the southeastern end of Kakagi Lake. Following a winter 7-hole, 3900-foot diamond drilling program, in which an east-trending favourable zone was tested at 1000-foot intervals along a strike length of 6500 feet, the company announced that a continuous gold-bearing zone with an average thickness of 100 feet was outlined along the full strike length explored. Gold assays were in the trace to low range, with the best section averaging 0.03 ounce gold per ton over 48 feet including 7 feet of 0.10 ounce gold per ton. Later in the year, Barrier Reef Resources Limited optioned the Electrum Lake gold prospect at High Lake, and carried out geophysical surveys and soil and humus geochemical sampling.

Pitting and trenching was also carried out on their Wicks Lake gold property.

Selco Incorporated, under a joint venture with Gossan Resources Limited, carried out surface stripping, and geophysical and geochemical surveys over a silicified and carbonatized gold-bearing zone, the Gaudry occurrence, at Sioux Narrows. Initial drilling consisted of 3 winkie drillholes, all of which returned gold values, and was followed by a larger drill program.

Noranda Mines Limited continued work on its Edwards-Fairservice gold property in the Bluff Point Lake area, formerly investigated by Selco Incorporated. This consisted of geologic mapping, stripping and trenching, and humus geochemical sampling.

As reported in the Northern Miner, August 11, 1983, Dash Lake Resources drilled 12 holes on its gold property at Dash Lake, in the Pipestone Lake area, as follow-up to geophysical surveys and sampling of old trenches in 1982. The company reported in the George Cross Newsletter, September 9, 1983, that they were encouraged by assays from 3 of the 12 holes.

Calaveras Explorations Limited carried out diamond drilling on their Sullivan Bay, Rowan Lake property in September, as follow-up to geologic mapping and geophysical surveys.

Gold Fields Canadian Mining conducted geophysical surveys, followed up by geological reconnaissance, sampling, and assaying on 3 claim groups in the general Cameron Lake area.

Other companies known to have done exploration for gold in the general Kakagi-Rowan-Cameron Lakes area

**TABLE 3**

## EXPLORATION ACTIVITY DURING THE YEAR

The following is a list of individuals and companies known to be engaged in exploration within the Kenora Mining Division in 1983 and the type of work undertaken in each case. The numbers correspond to the numbered areas on Figure 1.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Archibald, F.T. Consulting Ltd. | Geophysical surveys, Phillips Township |
| 2 | Armstrong, George | Diamond drilling, Halkirk Township |
| 3 | Asamera Inc. | Diamond drilling, assays, geochemical, geophysical surveys, Turtlepond and Boyer Lakes area |
| 4 | Barrier Reef Resources Ltd. | Geochemical, diamond drilling, assays, Heronry and Brooks Lakes area |
| 5 | Bonzano Exploration Ltd. | Geological, Kirkup Township |
| 6 | Brown, F.A.R. | Diamond drilling, Little Turtle Lake area |
| 7 | Busch, David J. | Metallurgical, Ewart Township |
| 8 | Calaveras Explorations Ltd. | Diamond Drilling, Rowan Lake area |
| 9 | Campbell, Bill G. | Stripping and trenching, Zealand Township |
| 10 | Canadian Nickel Company Limited | Geophysical surveys, Dogpaw and Rowan Lakes area |
| 11 | Fairservice, Robert J. | Geophysical survey, Drownridge Township |
| 12 | Fairservice, Robert J. | Geophysical surveys, Butler Lake area |
| 13 | Fairservice, Robert J. | Sampling, assays, trenching, geophysical surveys, Brooks Lake area |
| 14 | FTM Resources Inc. | Geophysical surveys, Dogpaw Lake area |
| 15 | Glatz, Alexander | Sampling, assays, trenching, Revell Township |
| 16 | Gold Fields Canadian Mining Limited | Geophysical surveys, Rowan Lake area |
| 17 | Farwacki, Pat and Clark, Greg | Stripping, Geophysical survey, geochemical, Haycock Township |
| 18 | Kroocmo, David and Murray, W.S. | Stripping, Factor Lake area |
| 19 | Kurylaw, Chester J. | Diamond drilling, Wiley Bay area |
| 20 | Martin, Jack D. | Geophysical surveys, Dogpaw Lake area |
| 21 | Martin, Roy | Stripping and trenching, Dogpaw Lake area |
| 22 | Mattagami Lake Exploration Limited | Diamond drilling, Halkirk Township |
| 23 | Mickelson, A. | Geological, assays, Snowshoe Bay area |
| 24 | Mistango Consolidated Resources Ltd. | Geophysical surveys, geological, Garnet Bay area |
| 25 | Nelson, Carter | Stripping, Docker Township |
| 26 | Noranda Exploration Company Limited | Geological, Bluffpoint Lake area |
| 27 | Noranda Exploration Company Limited | Diamond drilling, Cliff Lake area |
| 28 | Noranda Exploration Company Limited | Diamond drilling, Buller Township |
| 29 | Noranda Exploration Company Limited | Geophysical surveys, Gordon Lake area |
| 30 | Noranda Exploration Company Limited | Diamond drilling, Squint Lake area |
| 31 | P.I.R.P. Holdings Inc. | Geophysical surveys, Bad Vermilion Lake area |
| 32 | Pogson, Gordon | Stripping, Code Township |
| 33 | Riocanex Inc. | Diamond drilling, Dogpaw Lake area |
| 34 | Roberecki, Ed | Stripping, trenching, Code Township |
| 35 | Roberecki, Ed | Stripping, sampling, Manross Township |
| 36 | Roberecki, Ed | Stripping, Long Point Island area |
| 37 | Roberecki, Joel | Trenching, Ewart Township |
| 38 | Selco Inc. | Geophysical surveys, Shoal Lake area |
| 39 | Selco Inc. | Geophysical surveys, Echo Bay area |
| 40 | Selco Inc. | Geophysical surveys, diamond drilling, Shoal Lake area |
| 41 | Selco Inc. | Geophysical surveys, Snowshoe Bay area |
| 42 | Steep Rock Resources Inc. | Geophysical surveys, Mine Centre area |

TABLE 3 Continued

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 43 | Steep Rock Resources Inc. | Geophysical surveys, Little Turtle and Red Vermilion Lakes area |
| 44 | Tasu Resources Ltd. | Geophysical surveys, diamond drilling, Echo Bay area |
| 45 | Tasu Resources Ltd. | Diamond drilling, Shoal Lake area |
| 46 | Voyager Explorations Limited | Trenching, Aubrey Township |
| 47 | Wright, R.J. | Stripping, Hyndman Township |
| 48 | Wright, R.J. | Geophysical survey, Tabor and Kawashegamuk Lakes area |

in 1983 include: geophysical surveys in Phillips Township by F.T. Archibald Consulting Limited, geophysical surveys by Canadian Nickel Company Limited in the Dogpaw and Rowan Lake areas; geophysical surveys by Jack D. Martin at Dogpaw Lake; geophysical surveys by F.T.M. Resources Incorporated at the old Gauthier gold occurrence at Dogpaw Lake; geophysical surveys, assaying, and stripping and trenching on a gold occurrence in the Brooks Lake area on claims held by R. Fairservice; and other work by Jalna Resources Limited, Esso Minerals Canada, Sherritt Gordon Mines Limited, and Lynx-Canada Explorations Limited.

## Manitou-Wabigoon-Eagle Lakes Area

Teck Corporation acquired by purchase the Gaffney and Bee-Hive gold prospects at Manitou Island, Lower Manitou Lake, in August. In addition, large claim groups were staked around this property. It was announced in the Northern Miner, August 18, 1983, that Noxe Petroleum Corporation had an option to earn a 50% interest by spending $100 000 with Teck Corporation as operator. Surface exploration over the remaining summer was followed up by diamond drilling in the fall, with first results reported by the Northern Miner, November 24, 1983, from a hole drilled on the Gaffney prospect, in which 2 sections assayed 0.367 ounce gold per ton over 12 feet, and 0.141 ounce gold per ton over 8.4 feet.

It was announced in the Northern Miner, July 14th, 1983, that Geddes Resources Limited had entered into a joint venture with St. Joe Canada Incorporated on their gold properties at Upper Manitou Lake. Subsequently, a diamond drilling program was initiated on the Reliance gold prospect (Northern Miner, November 3, 1983).

Asamera Incorporated carried out an extensive exploration program centred on Peak and Sasakwei Lake, following an agreement between Asamera Incorporated and Shield Development Company, and 2 associated companies (Northern Miner, June 16, 1983). The 3 associated companies, all in the J.P. Sheridan Group, had obtained by option in late 1982 the rather spectacular Starr gold occurrence, reported on in the 1982 Report of the Kenora Resident Geologist (Blackburn and Hailstone 1983). Asamera Incorporated, as operator, carried out geological mapping, geochemical and geophysical surveys, and diamond drilling of 12 holes with a total length of 772 m.

Tasu Resources Limited carried out in 1983 a 3200-foot drill program over 6 holes on the old W.W. Smith and Magdalena gold prospects, as follow-up to humus geochemical sampling, magnetometer, and VLF surveys and channel sampling carried out in 1981-1982 (George Cross Newsletter, August 29, September 1, 22).

Raleigh Minerals Limited continued work on its Fornieri gold prospect at Eagle Lake. A 5-hole drill program, totaling 1114 feet, and targeting self potential anomalies, was reported on in the Northern Miner, July 7, 1983. A further 3 drillholes were reported on in the Northern Miner, August 25, and October 27, 1983, probing other anomalous zones.

Van Horne Gold Exploration Incorporated carried out detailed geological mapping, geophysical surveys, and prospecting on a group of claims encompassing the former producing Bonanza and Redeemer Gold Mines, in Van Horne Township, southwest of Dryden, according to the Northern Miner, July 28, 1983. Van Horne Gold Exploration Incorporated also entered into a joint venture with Teck Exploration on gold prospects near Kawashegamuk Lake, where geophysical, geochemical, and geological surveys were reported to have commenced (Northern Miner, October 27, 1983).

Under an option agreement with R. Fairservice, Royex Sturgex Mining Limited carried out electromagnetic and magnetic surveys at Birch Point, Wabigoon Lake.

Other companies known to have done exploration for gold in the general Manitou-Wabigoon-Eagle Lakes area in 1983 include: Teck Exploration in Hyndman and Revell Townships; Voyager Explorations Limited in Aubrey

TABLE 4

## ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

KENORA MINING DIVISION
SYMBOLS AND ABBREVIATIONS

Assess - Assessment work
Ag - Silver
As - Arsenic
Au - Gold
Be - Beryllium
BM - Base Metal
BS - Beneficiation Studies
Co - Cobalt
Cs - Cesium
Cu - Copper
DD - Diamond Drilling (where shown, the number following "DD" indicate the number of holes drilled and the total length drilled respectively).

STr - Stripping
Ta - Tantalum
Tr - Trenching
W - Tungsten
Zn - Zinc

Geochem - Geochemical Survey
GL - Geological Survey or Report
Humus Geochem - Humus Geochemical Survey
IP - Induced Polarization Survey
Lc - Linecutting
Li - Lithium
Ni - Nickel
Non Assess - Non Assessment Work Data
Pb - Lead
PD - Percussion Drilling
Prosp. - Prospecting
SA - Sampling, Assays

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Aubrey Township | 52F/14 SE | Denison Mines Limited | Au | Assess | GL | 1981 | 2.4095 | C-1 |
|  | 52F/14 SE | Hoban, Michael John | Au | Assess | DD 1-117' | 1982 | - | B-4 |
|  | 52F/14 SE | Voyager Explorations Limited | Au | Assess | Tr | 1983 | - | D-1 |
| Bad Vermilion Lake | 52C/10 NE | Cone, Russel C. | Au | Assess | STr, Tr, SA | 1982 |  | EE-5 |
|  | 5[illegible] 10 NE | Cone, Russel C. (Sherritt Gordon Option) | Au, Ag | Assess | GL, SA | 1982 | 2.5427 | EE-6 |
| Bad Vermilion, Little Turtle Lakes | 52C/10 NE<br>52C/15 SE | P.I.R.P. Holdings Inc. | Au | Assess | EM, Mag | 1981 | 2.4538 | MM-2 |
| Bad Vermilion Lake | 52C/10 NE | P.I.R.P. Holdings Inc. | Au, Ag, Cu | Assess | GL, EM, Mag | 1982 | 2.5442 | MM-3 |
| Bennett Lake | 52C/16 SW | Steeprock Iron Mines Limited | BM | Assess | EM, Mag | 1982 | 2.5282 | F-2 |
| Bliss Lake | 52C/10 NW | Pitkanen, R.W. | Au, Co | Assess | STr, Tr | 1982 | - | O-2 |
| Bluffpoint Lake | 52F/3 NW | Noranda Exploration Company Limited | Au, Ag | Assess | GL | 1980-81 | 2.5244 | I-2 |
|  | 52F/3 NW | Noranda Exploration Company Limited | Au | Assess | DD 7-799' | 1981 | - | I-3 |
|  | 52F/3 NW | Selco Inc. | Au | Assess | EM, Mag | 1981 | 2.5092 | H-5 |
| Bover Lake | 52F/7 NE | Essex Minerals Company | Au | Assess | EM, Mag | 1982 | 2.4827 | II-1 |
|  | 52F/7 NE | Starr, Eugene | Au | Assess | PD | 1982 | 2.5254 | GG-2 |
|  | 52F/7 NE | Kirsh, Milton | Au | Assess | Lc, Mag | 1981 | 2.4503 | JJ-1 |
|  | 52F/7 NE | Sulpetro Minerals Limited (Fairservice Option) | Au | Assess | EM, Mag | 1981-82 | 2.4609 | HH-1 |
| Brooks Lake | 52F/4 NE | Fairservice, Robert | Au, Ag | Assess | SA, Tr | 1983 | - | N-1 |
| Brownridge Township | 52F/15 SE | Fairservice, Robert | Li, Be<br>Ta, Cs | Assess | Mag | 1983 | 2.5476 | U-1 |
| Brownridge - Zealand Townships | 52F/15 SE | Sanmine Explorations Inc. | W | Assess | STr, Tr | 1982 | - | R-3 |
| Brownridge Township | 52F/15 SE | Tantalum Mining Corporation of Canada Limited | Li, Be,<br>Ta, Cs | Assess | Mag | 1982 | 2.5014 | T-1 |
| Buchan Bay | 52F/11 NE | Tasu Resources Ltd. | Au, BM | Assess | EM, Mag | 1982 | 2.4789 | AA-1 |
| Buller Township | 52K/3 SW | Noranda Exploration Company Limited | BM | Assess | DD 1-248' | 1983 | - | C-2 |
|  | 52K/3 SW | Noranda Exploration Company Limited | BM | Assess | GL | 1981-82 | 2.4810 | C-3 |
|  | 52K/3 SW | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.4814 | C-4 |
|  | 52K/3 SW<br>52K/3 SE | Noranda Exploration Company Limited | BM | Assess | GL | 1981-82 | 2.4812 | C-5<br>B-6 |
|  | 52K/3 SW<br>52K/3 SE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.5470 | C-7<br>B-7 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-7 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-8 |
| Butler Lake | 52F/10 NE | Euro-Dollar Development Limited | Au, BM | Assess | DD 1-345' | 1982 | - | K-14 |

TABLE 4 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Butler Lake,<br>Zealand Township | 52F/10 NE<br>52F/15 SE | Euro-Dollar Development Limited | BM | OMEP | SA, EM Mag | 1979-81 |  | F-15<br>F-8 |
| Butler Lake | 52F/10 NE | Euro-Dollar Development Limited | Au, BM | Assess | EM | 1982 | 2.5280 | F-16 |
|  | 52F/10 NE | Fairservice, Robert | Au | Assess | EM, Mag | 1983 | 2.5477 | M-1 |
| Cedar Lake | 52K/3 NE | Noranda Exploration Company Limited | Cu, Zn | Assess | EM, Mag | 1981-82 | 2.4813 | A-1 |
| Cedar Lake,<br>Cliff Lake | 52K/3 NE<br>52K/3 NW | Noranda Exploration Company Limited | BM | Assess | DD 8-511m | 1983 |  | A-2<br>A-3 |
| Cedar Lake | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4867 | A-4 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4868 | A-5 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.4929 | A-6 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4859 | A-7 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.4971 | A-8 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.4972 | A-9 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.5471 | A-10 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981 | 2.4930 | A-11 |
|  | 52K/3 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1982 | 2.5513 | A-12 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-7 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-4 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-5 |
|  | 52K/3 SW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-6 |
| Clay Lake,<br>Cliff Lake | 52K/3 SW<br>52K/3 NW | Noranda Exploration Company Limited | Cu, Zn | Assess | EM, Mag | 1981-82 | 2.4816 | C-1 |
|  | 52K/3 SW<br>52K/3 NW | Noranda Exploration Company Limited | BM | Assess | GL | 1982 | 2.5517 | C-6 |
| Clearwater Bay | 52E/10 NE | Denison Mines Limited | Au, Ag | Non Assess | EM, Mag<br>GL, Geochem | 1980-81 | 2.3939 | T-2 |
| Cliff Lake | 52K/3 NW | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | B-2 |
|  | 52K/3 NW | Noranda Exploration Company Limited | BM | Assess | DD 1-347' | 1983 | - | A-2 |
|  | 52K/3 NW | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4819 | B-3 |
| Code Township | 52E/9 SE | Pogson, Gordon | Au | Assess | STr | 1983 | - | S-1 |
|  | 52E/9 SE | Roberecki, Edward | Au | Assess | Tr | 1983 | - | Q-1 |
|  | 52E/9 SE | Roberecki, Edward | Au | Assess | STr | 1983 | - | Q-2 |
| Dash Lake | 52F/4 SE | Dash Lake Resources Ltd. | Au | Assess | EM | 1981 | 2.4620 | H-1 |
| Docker Township | 52F/14 SW | Nelson, Carter | Stone | Assess | STr | 1983 | - | L-1 |
| Dogpaw Lake | 52F/5 SW<br>52F/5 SE | Canadian Nickel Company Limited | BM | Assess | EM, Mag | 1983 | 2.5559 | C-2 |
|  | 52F/5 SW | FTM Resources Inc. | Au | Assess | EM, Mag | 1983 | 2.5668 | TT-1 |
|  | 52F/5 SW | Martin, Roy A. | Au | Assess | SA | 1982 | 2.5176 | RR-1 |
|  | 52F/5 SW | Martin, Roy A. | Au | Assess | STr, Tr | 1983 | - | RR-2 |
|  | 52F/5 SW | Noranda Exploration Company Limited (Colcleugh Option) | BM | Assess | IP, Mag | 1980 | 2.4631 | Z-10 |
|  | 52F/5 SW | Riocanex Inc. | Cu, Zn | Assess | DD 1-1747' | 1983 | - | SB-1 |

TABLE 4 Continued

| Locality | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Echo Bay | 52E/10 NW | Denison Mines Ltd. | Au, Cu, Zn, Ag | Assess | SA, GL, Geochem EM, Mag | 1980-81 | 2.3945 | BB-1 |
| | 52E/10 NW | Selco Inc. | BM | Assess | EM, Mag | 1983 | 2.5474 | I-12 |
| | 52E/10 NW | Tasu Resources Ltd. | Au | Assess | GL | 1982 | 2.4498 | Y-4 |
| | 52E/10 NW | Tasu Resources Ltd. | Au, Cu | Assess | Humus Geochem | 1982 | 2.4999 | Y-5 |
| | 52E/10 NW | Tasu Resources Ltd. | Au, Cu | Assess | Humus Geochem | 1982 | 2.5015 | Y-6 |
| | 52E/10 NW | Tasu Resources Ltd. | Au, Cu | Assess | Tr, SA | 1981 | 2.5016 | Y-7 |
| | 52E/10 NW | Tasu Resources Ltd. | Au | Assess | DD 3-1035' | 1983 | - | Y-8 |
| | 52E/10 NW | Tasu Resources Ltd. | Au | Assess | EM, Mag | 1983 | 2.5531 | Y-9 |
| Ewart Township,<br>Bundy Township | 52E/11 NE<br>52E/14 SE | Canadian Nickel Company Limited | BM | Assess | AEM | 1974 | 2.5889 | OO-1<br>R-1 |
| Ewart Township | 52E/11 NE | Roberecki, Joel | Au | Assess | Tr | 1983 | | LL-2 |
| | 52E/11 NE | Sherritt Gordon Mines Limited (Electrum Group) | Au, BM | Non Assess | EM, Mag, GL | 1981 | - | NN-1 |
| Factor Lake | 52C/9 NE | Froocmo, David, and Murray, W.S. | Au, Cu | Assess | STr | 1983 | - | D-2 |
| Gordon Lake | 52F/13 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag, GL | 1981 | 2.4534 | C-1 |
| | 52F/13 NE | Noranda Exploration Company Limited | BM | Assess | GL | 1981-82 | 2.4809 | C-2 |
| | 52F/13 NE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1983 | 2.5445 | C-3 |
| Halkirk Township | 52C/10 NW | Armstrong, George | BM | Assess | DD 1-240' | 1980 | - | H-20 |
| | 52C/10 NW | Armstrong, George | Cu, Zn | OMEP | DD 1-502' | 1980 | - | H-21 |
| | 52C/11 NE | Armstrong, George | Cu, Zn | Assess | DD 1-803' | 1983 | - | A-7 |
| | 52C/11 NE | Armstrong, George | Cu | Assess | DD 1-363' | 1983 | - | A-8 |
| | 52C/11 NE | Mattagami Lake Exploration Limited | BM | Assess | DD 1-307' | 1983 | - | NN-1 |
| Harper Lake | 52F/7 NW | St. Joe Canada Inc. | Au | Assess | DD 10-3,106' | 1982 | - | H-1 |
| Haycock Township | 52E/16 SW | President Mines Ltd. | Au | Assess | Prosp. | 1981 | 2.5159 | W-1 |
| | 52E/16 SW | Karwecki, Pat, and Clark, Greg | Au | Assess | STr | 1983 | - | X-1 |
| Heronry Lake,<br>Brooks Lake | 52F/4 NW<br>52F/4 NE | Barrier Reef Resources Ltd. | Au | Assess | DD 7-3,877' | 1983 | - | S-1<br>M-1 |
| | 52F/4 NW<br>52F/4 NE | Barrier Reef Resources Ltd. | Au | Non Assess | DD 7-2,016' | 1983 | - | S-2<br>M-2 |
| Heronry Lake | 52F/4 NW | Teck Explorations Limited | Au, Ag, Cu, Zn | Assess | EM, Mag | 1982 | 2.4758 | Q-2 |
| Hyndman Township | 52F/9 SE | Blatz, Alexander | Au, Ag | Assess | GL, STr, SA, Tr | 1982 | 2.5679 | I-3 |
| | 52F/9 SE | Wright, R.J. | Au | Assess | STr | 1983 | - | J-1 |
| Jaffray Township | 52E/16 SW | Sherritt Gordon Mines Limited | Au | Assess | Mag | 1980-81 | 2.3895,<br>2.3896 | V-3 |
| Kaiarskons Lake,<br>Bluff Point Lake | 52F/3 SW<br>52F/3 NW | Selco Inc. | Au | Assess | EM, Mag | 1981 | 2.5092 | H-1 |
| Kawashegamuk Lake | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4604 | O-1 |
| | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4605 | O-2 |
| | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4607 | O-3 |
| | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4608 | O-4 |
| | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4610 | O-5 |
| | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4611 | O-6 |

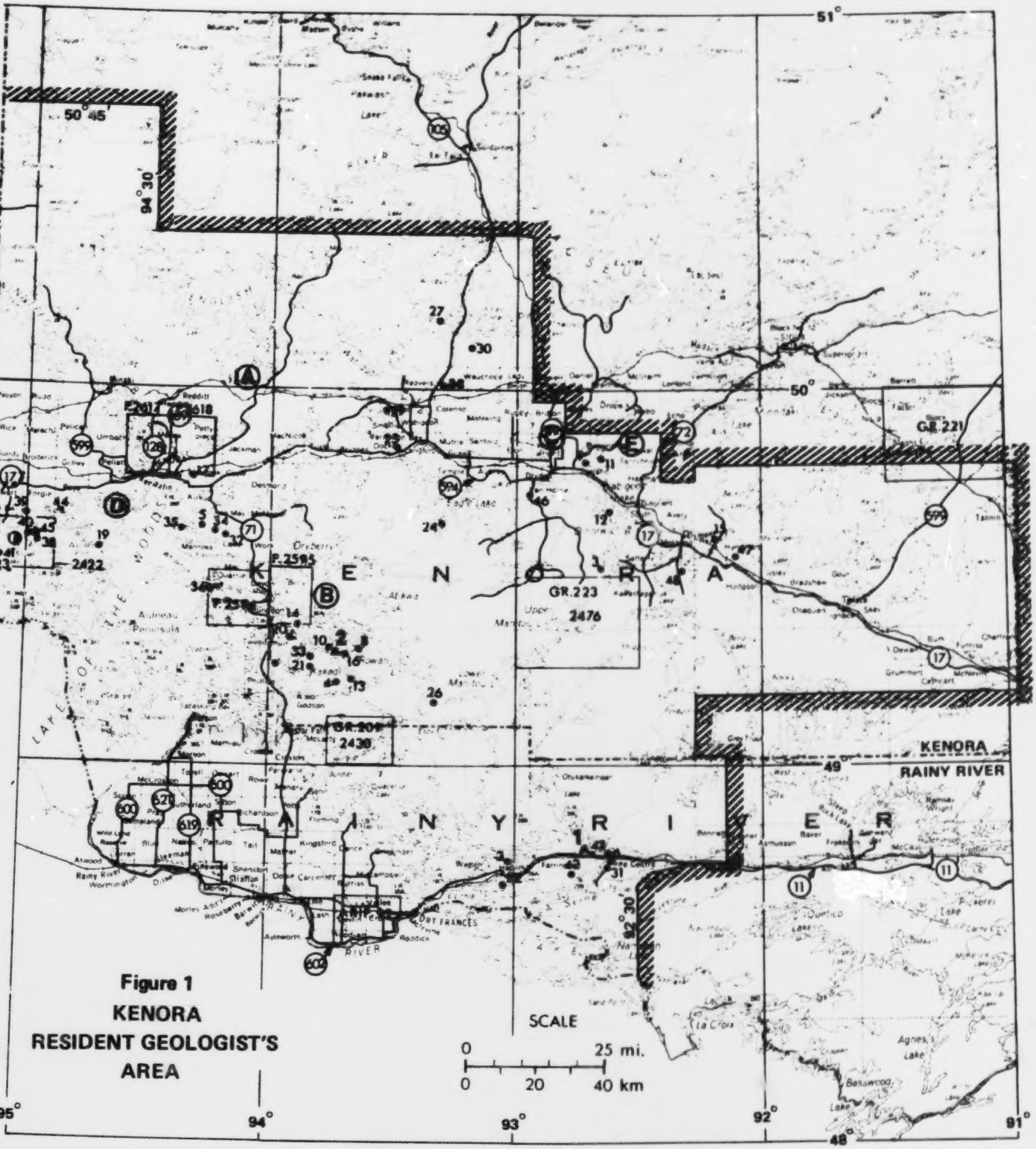
# KENORA — NORTHWESTERN REGION

**TABLE 4 Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Kawashegamuk Lake | 52F/8 NW | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4612 | D-7 |
| Kirkup Township | 52E/9 NW | Hansen, Edward<br>Zebruck, George | Au | Assess | STr, Tr, SA | 1982 | - | WW-2 |
| | 52E/9 NW | President Mines Ltd. | Au, Ag | Assess | BS, SA | 1982 | 2.5261 | SS-12 |
| Little Turtle Lake | 52C/15 SE | Pitkanen, R.W. | Au | Assess | STr, Tr | 1982 | - | S-4 |
| | 52C/15 SE | Brown, F.A.R. | Au | Assess | DD 1-201' | 1983 | - | X-1 |
| Long Point Island | 52E/8 NE | Roberecki, Ed | Au | Assess | STr | 1983 | | L-1 |
| Lower Manitou Lake | 52F/7 SW | Aur Resources Inc. | Au | Assess | EM, Mag | 1982 | 2.4829 | V-1 |
| | 52F/7 SW | St. Joe Canada Inc. | Au, Zn, Cu | Assess | DD 2-552' | 1982 | - | U-1 |
| MacFie Township | 52F/16 SW | Beth-Canada Mining Company | Au, Ag, Cu, Zn, Pb | Assess | DD 3-404.2m | 1979 | 2.3127 | R-2 |
| Manross Township | 52E/9 SW | Roberecki, Ed | Au | Assess | STr, SA | 1983 | | Q-2 |
| | 52F/9 SE | Sherritt Gordon Mines Limited | Au, BM | Assess | MAG | 1980-81 | 2.3897 | T-1 |
| Perrault Lake | 52K/6 SE | Noranda Exploration Company Limited | BM | Non Assess | EM, Mag | 1981 | 2.4920 | A-1 |
| Redvers Township, Wabigoon Township | 52F/14 NW | Noranda Exploration Company Limited | BM | Assess | GL | 1982 | 2.48[illegible]1 | F-1 |
| Revell Lake | 52F/8 NE | Sulpetro Minerals Limited | Au | Assess | EM, Mag | 1981-82 | 2.4606 | P-1 |
| Revell Township | 52F/9 SE | Glatz, Alexander | Au, Ag | Assess | SA, Tr | 1982-83 | | I-2 |
| | 52F/9 SE | Glatz, Alexander | Au | Assess | SA | 1981-82 | - | I-4 |
| Rowan Lake,<br>Brooks Lake | 52F/5 SE<br>52F/4 NE | Bruneau Mines Limited | Au | Assess | A Mag | 1970 | 2.5781 | MM-1 |
| Rowan Lake | 52F/5 SE | Calaveras Explorations Limited | Au | Assess | DD 1-198' | 1983 | - | NN-1 |
| | 52F/5 SE | Gold Fields Canadian Mining Limited | Au | Assess | EM, Mag | 1983 | 2.5576 | LL-1 |
| | 52F/5 SE | Gold Fields Canadian Mining Limited | Au | Assess | EM, Mag | 1982 | 2.5537 | LL-2 |
| | 52F/5 SE | Nuinsco Resources Limited | Au, Ag | Assess | IP, Mag, SA, GL | 1981 | 2.4420 | JJ-2 |
| Shoal Lake | 52E/10 SW | Denison Mines Limited | Au | Non Assess | EM, Mag, GL Geochem | 1981 | 2.4145 | JJ-1 |
| | 52E/10 SW | Selco Inc. | Au | Assess | EM, Mag | 1983 | 2.5474 | L-2 |
| | 52E/10 SW | Tibbo, Harold G. | Au | Assess | DD 2-1075' | 1983 | | GG-3 |
| Snowshoe Bay | 52E/11 SE | Selco Inc. | Au | Assess | DD 2-800' | 1982 | - | D-2 |
| | 52E/11 SE | Consolidated Professor Mines Limited | Au | OMEP | EM, GL,<br>DD 15-6720' | 1981 | - | B-2 |
| | 52E/11 SE | Selco Inc. | Au | Assess | DD 1-400' | 1982 | - | D-3 |
| Snowshoe Bay,<br>Shoal Lake | 52E/11 SE<br>52E/10 SW | Selco Inc. | Au | Assess | EM, Mag | 1982 | 2.4942,<br>2.5102,<br>2.5408 | D-4 |
| Snowshoe Bay | 52E/11 SE | Selco Inc. | Au | Assess | DD 2-1397' | 1983 | - | D-5 |
| Squint Lake | 52K/3 SE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4818 | B-2 |
| | 52K/3 SE | Noranda Exploration Company Limited | BM | Assess | DD 1-298' | 1983 | - | B-3 |
| | 52K/3 SE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.4815 | B-4 |
| | 52K/3 SE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1981-82 | 2.5077 | B-5 |
| | 52K/3 SE | Noranda Exploration Company Limited | Cu | Assess | GL, Geochem | 1982 | 2.5518 | B-8 |
| | 52K/3 SE | Noranda Exploration Company Limited | BM | Assess | EM, Mag | 1982 | 2.5353 | B-9 |
| | 52K/3 SE | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | A-4 |

TABLE 4 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Squint Lake | 52F/3 SE | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | A-5 |
|  | 52F/3 SE | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461,<br>2.4742 | A-6 |
|  | 52F/3 SE | Selco Inc. | BM | Assess | EM, Mag | 1981 | 2.4461 | A-7 |
| Tabor Lake,<br>Melgund Township | 52F/9 SW | Kuryliw, Chester J. | Au | Assess | EM, Mag, GL | 1982 | 2.5362 | DD-1 |
| Tabor Lake | 52F/9 SW | Redden, J.W. | Au, Ag | Assess | EM, Mag | 1981 | 2.4528 | V-7 |
|  | 52F/9 SW | Sulpetro Minerals Limited | Au, Ag, As | Assess | GL, SA | 1981 | 2.5120 | CC-3 |
|  | 52F/9 SW | Sulpetro Minerals Limited | Au, Ag, As | Assess | EM, Mag | 1981 | 2.4370 | CC-4 |
| Turtlepond Lake,<br>Bover Lake | 52F/10 SE<br>52F/7 NE | Asamera Inc. | Au, Ag | Assess | DD 12-772.28m | 1983 | - | Z-1 |
|  | 52F/10 SE<br>52F/7 NE | Asamera Inc. | Au, Ag | Assess | SA, Geochem | 1982 |  | Z-2 |
| Turtlepond Lake | 52F/10 SE | Sovereign, Wm.J. | Au | Assess | STr, SA, Geochem | 1982 | - | Y-1 |
|  | 52F/10 SE | Sovereign, Wm.J. | Au, Ag, Co, Cu, Pb, Zn | Assess | GL, SA, STr | 1981 | 2.4418 | Y-2 |
| Turtlepond Lake,<br>Tabor Lake,<br>Satterly Township | 52F/10 SE<br>52F/9 SW | Corporation Falconbridge Copper | BM, Au | Assess | GL | 1980 | 2.4713 | X-2<br>BB-2 |
| Van Horne Township | 52F/15 SW | Glatz, Alexander (Van Horne-Watson Lake Joint Venture) | Au | Assess | EM, Mag | 1982 | 2.5334 | F-1 |
| Van Horne Township,<br>Contact Bay | 52F/10 NW | Van Horne Gold Exploration Inc. | BM | Assess | EM, Mag | 1980-81 | 2.4078 | NN-1 |
| Van Horne Township | 52F/15 SW | Van Horne Gold Exploration Inc. | Au, Ag | OMEP | DD 24-5441' | 1980 | - | F-1 |
| Vista Lake,<br>Kaiarskons Lake | 52F/3 SE<br>52F/3 SW | Teck Explorations Limited | Au | Non Assess | GL, EM ,Mag | 1980 | 2.3743 | D-1 |
| Wapageisi Lake,<br>Bending Lake | 52F/8 SW<br>52F/8 SE | Sulpetro Minerals Limited | Au | Assess | GL | 1982 | 2.4921 | H-1 |
| Watten Township,<br>Halkirk Township | 52C/11 NE<br>52C/10 NW | Lewis, A.J. | Cu, Ni | Assess | EM, Mag | 1982 | 2.5064 | MM-2 |
| Wiley Bay | 52E/10 SE | Kuryliw, Chester J. | Au | Assess | DD 1-481' | 1983 | - | F-7 |
|  | 52E/10 SE | Tasu Resources Limited | Au, Cu, Zn, Pb | Assess | Geochem | 1981 | 2.4790 | N-1 |
|  | 52E/10 SE | Tasu Resources Limited | Au | Assess | EM, Mag | 1981 | 2.4791 | N-2 |
| Zealand Township | 52F/15 SE | Campbell, Bill G. | W | Assess | STr | 1982 | - | S-1 |
|  | 52F/15 SE | Campbell, Bill G. | W | Assess | STr, Tr | 1983 | - | S-2 |



MANITOBA
51°
50°45'
94°30'
50°
49°
48°
95°
94°
93°
92°
91°
92°30'
K E N O R A
R A I N Y R I V E R
KENORA
RAINY RIVER
LAKE OF THE WOODS
ENGLISH RIVER
Aulneau Peninsula
FORT FRANCES
RAINY RIVER
GR.221
GR.223
2476
P.2595
GR.209
2430
2422
223
A
B
D
E
105
599
17
71
502
72
11
600
602
615
619
621
Upper Manitou
Eagle Lake
Quetico
Wabigoon
SCALE
0
25 mi.
0
20
40 km

**Figure 1**

**KENORA RESIDENT GEOLOGIST'S AREA**

EXPLANATION

▲ Properties under evaluation, 1983
- 1. Homestake Explorations Ltd.
- 2. Nuinsco Resources Ltd. - Lockwood Petroleum

◐ Mines and/or Properties under development, 1983
Consolidated Professor/Union Carbide

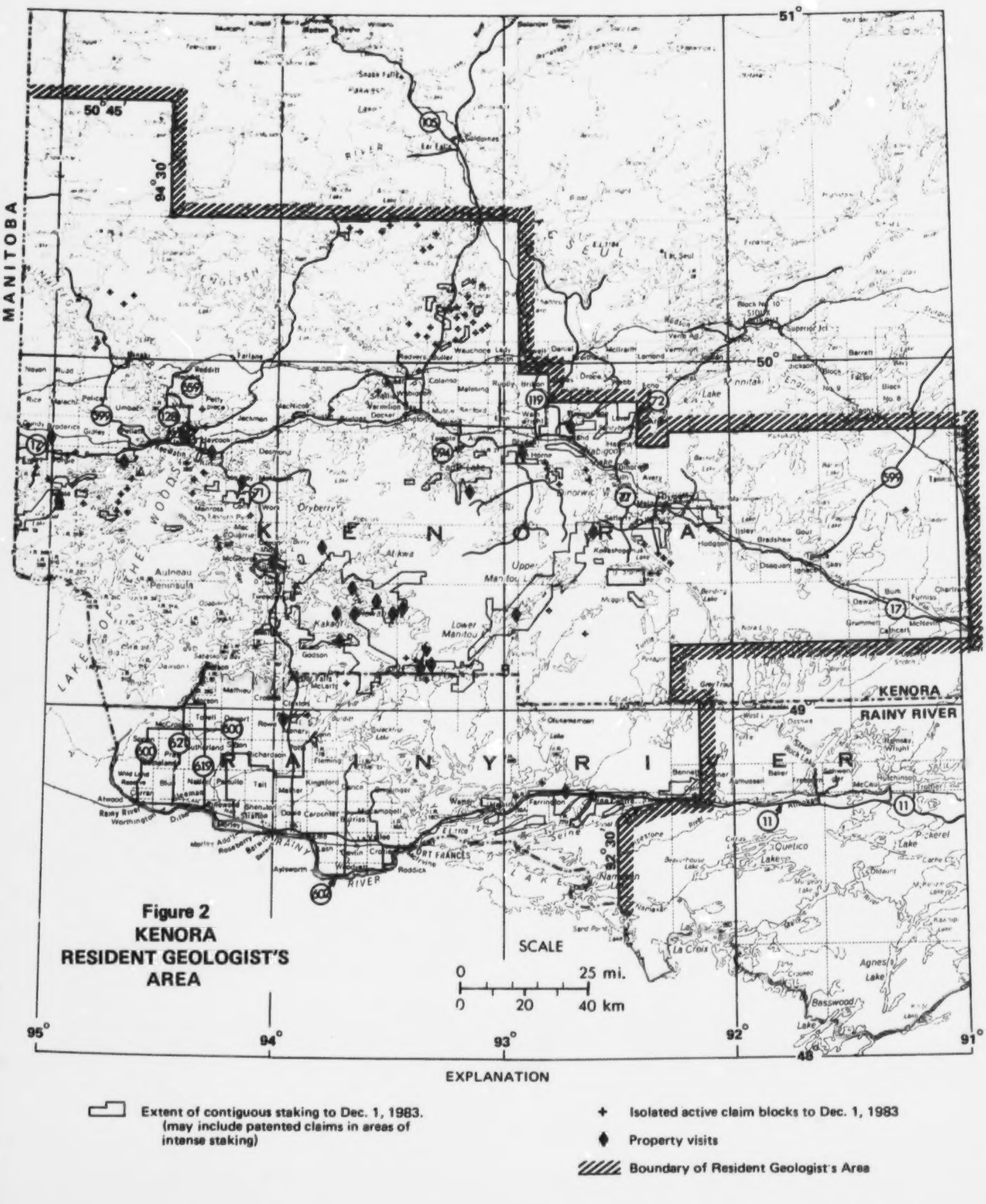
Ⓑ Location of OGS Field Party and/or Special Project, 1983

● Exploration Activity, 1983 (keyed to Table 3)

—— Map or Report issued by Ontario Geological Survey, 1983 (keyed to Table 2)

P. — Preliminary Map
2422 — Coloured Geological Map
GR — Ontario Geological Survey Report
ARIP — Aggregate Resources Inventory Paper

▨ Boundary of Resident Geologist's Area



MANITOBA
51°
50°45'
94°30'
50°
49°
48°
95°
94°
93°
92°
91°
92°30'
K E N O R A
R A I N Y R I V E R
KENORA
RAINY RIVER
LAKE OF THE WOODS
ENGLISH RIVER
LAC SEUL
Aulneau Peninsula
Dryberry
Atikwa
Kakagi
Upper Manitou L.
Lower Manitou
RAINY RIVER
RAINY LAKE
FORT FRANCES
Quetico Lake
Basswood Lake
Agnes Lake
La Croix
Pickerel Lake
Sioux Lookout
Ear Falls
Red Lake
Kenora
Rainy River
Atwood
Worthington
Emo
Seine
Namakan L.
17
11
71
105
119
502
594
596
599
600
602
619
621
622
642
72
SCALE
0 25 mi.
0 20 40 km

Figure 2
KENORA
RESIDENT GEOLOGIST'S
AREA

EXPLANATION

- ▭ Extent of contiguous staking to Dec. 1, 1983. (may include patented claims in areas of intense staking)
- ✚ Isolated active claim blocks to Dec. 1, 1983
- ♦ Property visits
- ▨ Boundary of Resident Geologist's Area

Township; geophysical and geological surveys by Mistango Consolidated Resources Limited in the Eagle Lake area; and other work by Jalna Resources Limited, Esso Minerals Canada, and Labrador Mining and Exploration Company Limited.

## Lake of the Woods-Shoal Lake Area

Selco Incorporated continued its regional exploration program in the Shoal Lake area in 1983, as a joint venture with Consolidated Professor Mines Limited. Work consisted of electromagnetic and magnetic surveys, and follow-up diamond drilling. A total of 15 000 feet of drilling was carried out over 12 holes in January and February.

Other exploration known to have been conducted for gold in the general Lake of the Woods-Shoal Lake area included: geological mapping, sampling, and assaying by Bonzano Exploration Limited on the Gold Hill, Black Jack, and associated gold prospects in Kirkup Township; geochemical sampling, geophysical surveying, and manual labour by P. Karwacki and G. Clark on ground near the Champion gold prospect, Haycock Township; diamond drilling by C. Kuryliw on the Gold Mountain gold prospect, Wiley Bay area; geological mapping and assaying by A. Mickelson on the western side of Shoal Lake; manual work by G. Pogson west of the Triggs prospect, in Code Township; trenching, stripping, and sampling by E. Roberecki in Code and Manross Townships and the Long Point Island area; manual labour by J. Roberecki south of High Lake in Ewart Township; diamond drilling of 3 holes totaling 1035 feet on the old Tycoon prospect at Bay Bay, Shoal Lake, by H. Tibbo; geophysical surveys and diamond drilling by Tasu Resources Limited at Echo Bay, Lake of the Woods; and other work by Raleigh Minerals Limited, Canadian Nickel Company, Barrier Reef Resources Limited, and New Ambrose Resources.

## Mine Centre Area

Exploration in the Mine Centre area, normally quite active, has been overshadowed by activity elsewhere in 1983. Sherritt Gordon Mines Limited, from its exploration office in Dryden, concluded their assessement of the Ferguson, Foley, Manhatten, Decca, Lucky Coon, and McKenzie-Gray properties, commenced in 1982. Homestake Explorations Limited carried out a bulk sampling, geophysical, and geological mapping program at the old Olive Mine as reported in the Northern Miner, June 30, 1983. Central Crude Limited commenced an exploration program on a claim group that includes the Stellar gold occurrence, on the northern side of Bad Vermilion Lake.

Other exploration known to have been carried out for gold included: geophysical surveys by P.I.R.P. Holdings Incorporated at Bad Vermilion Lake, in the vicinity of the former Golden Star Mine; power stripping by D. Kroocmo and W. Murray in the Factor Lake area; diamond drilling by P. Brown at the northeastern end of Bad Vermilion Lake; and geophysical, geochemical, and geological surveys by Lynx-Canada Explorations Limited in Bennett Township.

## Base Metals

A number of major companies carried out exploration for base metals in the Kenora Mining Division in 1983. Two of these companies have been actively exploring in the Division for a number of years: Noranda Exploration Company Limited continued its regional exploration program in the English River Subprovince, north of Vermilion Bay, with geophysical and geological work, and diamond drilling in the Cliff Lake, Gordon Lake, Squint Lake areas, and in Buller Township, and also exploration in the Fort Frances-Mine Centre area; Selco Incorporated, in conjunction with their regional gold exploration program, investigated a number of geophysical anomalies picked up on an airborne electromagnetic-magnetic survey for base metals in the general Shoal Lake area.

Riocanex Incorporated diamond drilled a 1747-foot hole on the Weisner Lake copper-zinc prospect.

Steep Rock Resources Incorporated carried out geophysical surveys in the northeast-trending volcanic belt extending from Pine Point to Mine Centre, in the same stratigraphic sequence as the former Port Arthur Copper Mine.

G. Armstrong diamond drilled 2 holes in Halkirk Township, one 803-foot hole on the Pocket Pond copper-zinc prospect, and another 363-foot hole on a copper occurrence at the northeastern end of Grassy Portage Bay.

Agassiz Resources Limited also was involved in base-metal exploration in Menary Township, northwest of Fort Frances.

## Other Minerals

The Tantalum Mining Corporation of Canada (Tanco) concluded work on the tantalum-lithium pegmatite property in Brownridge Township, near Mavis Lake, optioned from R. Fairservice. A magnetometer survey was conducted in early 1983 over 2 claims adjoining a larger claim group surveyed in 1982. Tanco have subsequently dropped the optioned claims, as a result of a general termination of exploration for tantalum by the company.

Sanmine Explorations Incorporated continued their work on a scheelite occurrence, also near Mavis Lake, in Zealand and Brownridge Townships. Extensive surface stripping was carried out in 1983.

# Property Examinations

In 1983, the following mining and exploration properties, and mineral occurrences and prospects were examined by the Kenora Resident Geologist's staff as part of the regular program.

Gold:

- Bee-Hive Prospect - Lower Manitou Lake area
- Black Jack Occurrence - Kirkup Township
- Bonanza Mine - Van Horne Township
- Cameron Island Mine (Duport Mine) - Snowshoe Bay area
- Cameron Lake Prospect - Rowan Lake area
- Cornucopia (Cedar Island) Mine - Glass Township
- Crown Point Prospect - Glass Township
- Edwards-Fairservice Prospect - Bluffpoint Lake area
- Electrum Lake Prospect - Ewart Township
- Errington Prospect - Lawrence Lake area
- Fairservice Mushkasu Lake Prospect - Lobstick Bay area
- Gaffney Prospect - Lower Manitou Lake area
- Gaudry Prospect - Willingdon Township
- Gold Hill Occurrence - Kirkup Township
- Kakagi Lake (East Group) Prospect - Herony and Brooks Lake area
- Kenricia Mine - Clearwater Bay area
- Konigson Occurrence - Straw Lake Beach area
- Magdalena Prospect - Buchan Bay area
- Meston Occurrence - Rowan Lake area
- Mikado Mine - Glass Township
- Monte Cristo Prospect - Rowan Lake
- Olive Mine - Little Turtle Lake area
- Olympia Mine - Glass Township
- Pine Portage Prospect - Kirkup Township
- Redeemer Mine - Van Horne Township
- Sovereign Peak Lake Occurrence - Turtlepond Lake area
- Starr, E., Occurrence - Boyer Lake area
- Straw Lake Beach Mine - Bluffpoint Lake area
- Sullivan Prospect - Rowan Lake area
- Treasure Prospect - Haycock Township
- Tycoon Prospect - Glass Township
- Wampum Prospect - Rowan Lake area

Base Metals:

- Menary Township Zinc Occurrence - Menary Township

Tungsten:

- Zealand-Brownridge Tungsten Prospect - Zealand and Brownridge Townships

## Building, Monumental, and Decorative Stone Project

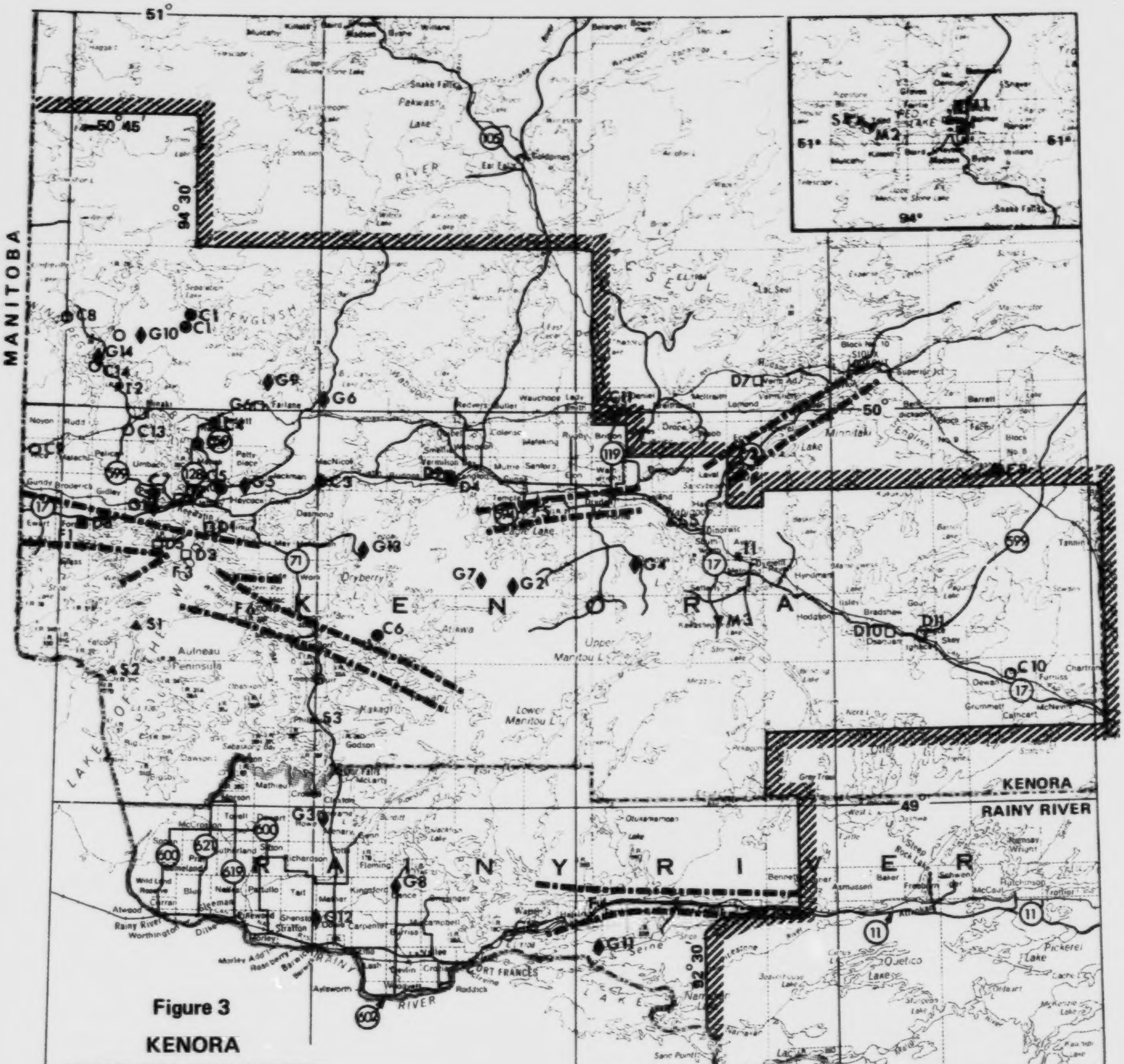
This project is a continuation of the building, monumental, and decorative stone inventory described by Blackburn and Hailstone (1983). Funding is provided through the Northern Ontario Rural Development Agreement (NORDA).

The project was undertaken to encourage further development of the stone industry in Northwestern Ontario. To date, several companies have shown an interest in stone deposits within the area. A preliminary report describing the results of the 1982 work was published in May 1983 (Storey 1983). A final report is being prepared and a computerized catalog of literature pertaining to stone deposits will be produced early in 1984. The market study mentioned by Blackburn and Hailstone (1983) was completed and is being prepared for publication in 1984.

Six major deposits are currently in production or under development in the area. The Nelson Granite Division of Nelson Monuments Limited and Universal Granite Centre (1976) Limited produce pink granite for monumental and building use. Rush Bay Quarries produces a well-foliated metavolcanic for building facing and flagstone. The East Hawk Lake and Watcomb Quarries produce railway track ballast on an intermittent basis. Material is crushed by a contractor over several months and is used as required from the stockpile. The East Hawk Lake Quarry is in granitoid rock and the Watcomb Quarry is in mafic metavolcanics (traprock). The Avery Township property (also in mafic metavolcanics) is being developed by Canadian Pacific Railways to produce track ballast. Production at the White Quarry ceased in late 1982. Several quarries were opened to produce crushed stone aggregate for: construction of the Kenora Bypass on Highway 17, forest access roads to Separation Lake, and the Maybrun Road. A large quarry at Wade produced aggregate for reconstruction of Highway 596, but closed on completion of this project. In addition to these producers, there are numerous past producers of granite dimension stone, crushed stone, slate for roofing, flagstone, and mariposite-bearing rocks for decorative stone. Figure 3 shows the location of these deposits and Table 5 lists the known producers, past producers, and prospects, plus areas studied under the present project.

Field work in 1983 consisted of follow-up geological mapping and sampling of granitoid and gabbroic rocks which had been indicated by the 1982 field work, plus examination of additional areas of granitoid rocks, foliated rocks, soapstone, and decorative stone. A description of the terminology used in the stone industry can be found in Blackburn and Hailstone (1983).

The most promising granite deposits found to date are in the English River Subprovince. These consist of late-stage granite, quartz monzonite, and granodiorite bodies located in the southern part of the subprovince. Several pink to pink-red coloured bodies as well as numerous grey and a few brown coloured granitoids have been located. Deposits of variegated granite (well-layered gneisses and nebulitic migmatite) are found within areas of metasediments and non-homogeneous granitoids in the English River Subprovince and in the Quetico Fault mylonite zone where it crosses granitoid rocks. The so-called "black granites" are not nearly as numerous. The best examples are the Mulcahy Lake Intrusion and the Bad Vermilion and Grassy Portage Sills. These bodies contain gabbroic anorthosite phases which, in some cases, are free of deleterious minerals and are uniform enough to be quarried. Many of the gabbroic bodies examined contain sulphide mineralization, extensive altera-



51°
50°45
94°30
MANITOBA
Pakwash Lake
RIVER
105
Ear Falls
LAC SEUL
Lac Seul
ENGLISH
C8
C1
C1
G10
G14
C14
T2
G9
G6
G4
C13
C7
599
128
C5
G5
C3
D2
D4
119
D7
50°
Minnitaki Lake
English
F2
F9
17
D6
D1
F1
D5
D3
F3
71
G13
G7
G2
G4
T1
17
599
K E N O R A
S1
F6
C6
M3
D10
D11
C10
17
Aulneau Peninsula
S2
Upper Manitou L.
Lower Manitou L.
LAKE OF THE WOODS
S3
Kakagi
Dryberry
KENORA
RAINY RIVER
49°
G3
600
621
600
619
R A I N Y R I V E R
G8
G12
11
11
G11
FORT FRANCES
RAINY RIVER
602
92°30
Quetico Lake
Namakan L.
RAINY LAKE
La Croix
Agnes Lake
Basswood Lake
Pickerel Lake
SCALE
0
25 mi.
0
20
40 km
95°
94°
93°
92°
91°
48°
51°
94°
M1
M2
S4
RED LAKE
Snake Falls

**Figure 3**

**KENORA RESIDENT GEOLOGIST'S AREA**

**EXPLANATION**

Dimension Stone Quarry
- ■ producer
- □ past producer

Crushed Stone Quarry
- ● producer
- ○ past producer

* Stone Deposit under investigation by the industry

♦ 'Granite' study areas, 1983

▲ Soapstone deposits

▼ Marble-type deposits

▬ ▪ ▬ Flagstone/slate areas

G1,C1, S1 Deposit Number (keyed to Table 5)

▨ Boundary of Resident Geologist's Area

**TABLE 5** | **BUILDING AND MONUMENTAL STONE DEPOSITS[1]**

**Granite Study Areas 1983**

G1 Bypass Gneiss
G2 Chancellor Lake
G3 404 Road
G4 Highway 502
G5 Island Lake Diorite
G6 Keys Lake area
G7 Mulcahy Lake
G8 Quetico Fault mylonite
G9 Red Deer Lake Road area
G10 Sand Lake Road area
G11 Scott Islands
G12 Shenston Diabase Dike
G13 314 Road area
G14 Whitedog Falls

**Dimension Stone Quarries**

(including decorative stone and flagstone)

D1 CPR Quarry Island - granite
D2 CPR Quarry Island Keewatin - granite
D3 Gibbons Slate Quarry - slate
D4 Nelson Granite Ltd. - granite
D5 Northern Peninsula - mariposite
D6 Ontario Granite Company-Farlane - granite
D7 Rainbow Quarry - mariposite
D8 Rush Bay Quarries - flagstone
D9 Universal Granite Centre (1976) Ltd. - granite
D10 Wm. Horne Granite Co.- Butler - granite
D11 Wm. Horne Granite Co.- Ignace - granite

**Crushed Stone Quarry**

C1 B & J Equipment Rentals (for MNR) - 3 quarries, crushed granite aggregate
C2 CNR Watcomb - crushed traprock for track ballast.
C3 CPR East Hawk Lake - crushed granite for track ballast
C4 DenJon Const. (for MTC) - 2 quarries, crushed granite aggregate
C5 Mathews Group Ltd. (for MTC) - 2 quarries, crushed granite aggregate
C6 MNR - rock fill
C7 Niakwa Construction (for MTC) - crushed granite aggregate
C8 Caribou Falls (for Ont. Hydro) - crushed granite for concrete aggregate
C9 CNR White - crushed granite for track ballast
C10 CPR Bonheur - crushed granite for track ballast
C11 CPR Richan - crushed granite for track ballast
C12 Rocky Inlet - crushed granite and metasediment for fill and aggregate
C13 Wade (for MTC) - crushed granite for aggregate
C14 Whitedog Falls (for Ontario Hydro) - crushed granite for concrete aggregate
Unnumbered MTC wayside quarries

**Stone Deposits Under Investigation**

I1 Avery Township (metabasalt for track ballast)
I2 Cygnet Lake (granite building stone)

**Flagstone/Slate Study Areas**

F1 Crowduck - Rush Bay Lineament
F2 Minnitaki Lake - Vermilion Lake area (Little Vermilion Fault Zone)
F3 Northern Lake of the Woods
F4 Quetico Fault
F5 Wabigoon Fault
F6 Yellow Girl Bay - Sioux Narrows (Pipestone - Cameron Fault Zone)

**Soapstone/Talc Deposits**

S1 Coste Island
S2 Mica Point
S3 Phillips Township
S4 Red Lake area
S5 Wabigoon Resources Ltd.
for the remaining deposits see Blackburn and Hailstone (1983) Table 5, Figure 2.

**Marble Type Deposits**

M1 Dome Township (serpentinite)
M2 Hahn Lake (carbonate metasediment)
M3 Kawashegamuk Lake area (carbonatized metavolcanics and carbonate veins)

---

[1] Locations are keyed to Fig. 3

Deposits indicated as producers are known to have produced at some time during 1983. Two map symbols with the same number indicate a company operating two deposits simultaneously or several study areas grouped together.

tion, or are extensively fractured. The most promising of these deposits are located away from major fault or fold systems and are late-stage intrusions.

Areas of highly schistose rocks are commonly associated with the many major and minor fault systems in the area. The deposits that have stone potential are fine-grained rocks, usually felsic metavolcanics or fine-grained metasediments. Several areas in northern Lake of the Woods and Shoal Lake contain potential deposits of flagstone. The Pipestone-Cameron Fault Zone, the Little Vermilion Fault Zone, and the Quetico Fault Zone contain well-foliated rocks that have good potential for flagstone.

True slates are fine-grained metasediments usually dark grey, dark green, or dark blue in colour with a well-developed slaty cleavage. True slate has been quarried from a deposit in the Lake of the Woods area (*circa* 1884), and numerous examples of slaty cleavage developed in folded metasediments and metavolcanics are present in this area. A sequence of metasediments north of Yellow Girl Bay (Lake of the Woods) contains a significant thickness of dark grey and dark green slate. These deposits were first noted by Lawson (1886).

With a few exceptions, the known soapstone deposits are small. Recent extraction has been for artistic carving material. In October, Wabigoon Resources began stripping and sampling a talc/soapstone deposit located on the Wabigoon Peninsula. Examination of the known deposits indicates 2 types of occurrence: (1) altered mafic or ultramafic intrusive rocks, and (2) altered mafic metavolcanics which may or may not have been affected by shearing. Several occurrences of both types have been located. The intrusive type deposits (Wabigoon, Trap Lake, Mile Lake, Phillips Township) have the greatest potential in terms of size and high talc content, but the metavolcanic deposits (Coste Island, Mica Point) are probably more numerous although they tend to be small and have a low talc content. In general, the area has a good potential for talc/soapstone deposits.

Investigation of marble-type deposits has indicated several small deposits consisting of attractive carbonate veins or carbonate metasediments. Many of the calc-silicate rocks and chemical metasediments are too narrow and contain too much gritty siliceous material to have any potential as commercial marble. Serpentinite and other ultramafic rocks that polish well enough for some uses have been found; however, their mineralogy restricts many of them to indoor use only. Carbonatized metabasalts constitute another type of deposit within the area that could be classified as marble.

Decorative stone covers many lithologies in additon to those mentioned above. Mariposite-bearing rocks are included under this category. Two types have been noted: (1) the quartzite-chrome mica association (Rainbow Quarry near Hudson), and (2) the chrome mica-chlorite-magnesite-quartz-carbonate vein-sulphide association (Northern Peninsula). This latter type of deposit is much more common and is developed in metavolcanic terrains associated with gold mineralization. Pegmatites, felsic porphyry intrusions, and many metavolcanics produce very attractive samples and could be used to make a variety of decorative objects.

## Ontario Geological Survey Activities

During the 1983 field season, the following field parties from the Precambrian Geology and Mineral Deposits Sections operated within the Kenora Mining Division:

G.P. Beakhouse, G.M. Stott, and R.H. Sutcliffe (all geologists with the Precambrian Geology Section) carried out an investigation of the southern part of the English River Gneiss Belt in order to determine the economic potential of supracrustal lithologies within the area (Figure 1, (A) symbol).

G.W. Johns (Precambrian Geology Section) completed mapping begun in 1981 south of the Dryberry Lake area (Figure 1, (B) symbol).

F.W. Breaks (Precambrian Geology Section) focused on the petrological and geochemical characteristics of mineralization in the rare-earth pegmatites just north of Dryden (Figure 1, (C) symbol).

J.C. Davies and P.M. Smith (Mineral Deposits Section) commenced a 2-year study on the characteristics of gold deposits in the Lake of the Woods area (Figure 1, (D) symbol).

M.E. Cherry (Mineral Deposits Section) examined the association between mineralization and granitoid rocks through the Sioux Lookout-Dryden area (Figure 1, (E) symbol).

## Ontario Mineral Exploration Program (OMEP)

As of December 1st, 1983, 31 designated OMEP programs were operative in the Kenora Mining Division.

Thirty of these are for gold exploration, and include: Academy Explorations Limited in the Clearwater Bay area; Asamera Incorporated in the Boyer Lake and Turtlepond Lake areas; Atikwa Resources Incorporated in the Clearwater Bay area; Barrier Reef Resources Limited in the Heronry Lake area; Bonzano Exploration Limited in Kirkup Township; Busch, David Janes in Ewart Township; Central Crude Limited in Little Turtle Lake and Bad Vermilion Lake areas; Cochrane Oil and Gas Limited in the Lower Manitou Lake area; Flint Rock Mines Limited in the Dogpaw Lake area; Francis Resources Limited in the Dogpaw Lake area; Golden Rule Resources Limited in Glass Township; Gold Mountain Syndicate in the Wiley Bay area; Homestake Explorations Limited in the Little Turtle Lake area; Jalna Resources Limited in the Lower Manitou Lake area; Kalrock Developments Limited in Halkirk and Watten Townships; Kuryliw, Chester in the Boyer

Lake area; Lockwood Petroleum Incorporated in the Rowan Lake area; Lynx-Canada Explorations Limited in Bennett Township; Mickelson, A. in the Snowshoe Bay area; Monte Cristo Resources Limited in Melgund Township and Tabor Lake area; Nuinsco Resources Limited in the Rowan Lake area; Regal Goldfields Limited in the Dogpaw Lake area; St. Joe Canada Incorporated in the Upper Manitou Lake area; St. Joe Canada Incorporated and Geddes Resources Joint Venture in the Lower Manitou Lake area; Sheridan, Pat in the Atikwa Lake area; Sherritt Gordon Mines Limited in the Dogpaw Lake area; Sovereign, W.D. in the Contact Bay area; Spartan Resources Incorporated in the Bluffpoint Lake area; Teck Corporation in the Upper and Lower Manitou Lakes area; and Van Horne Gold Exploration Incorporated in Van Horne Township and the Contact Bay area.

The additional program, now terminated, was for tantalum, by Tantalum Mining Corporation of Canada Limited in Brownridge Township.

# Research by Other Agencies

## University Theses

Geological theses related to the Kenora Mining Division believed to be in progress during 1983 are as follows:

M.Sc.

Davison, Greg: Continued a study commenced in 1982 on the volcanology of the Berry Creek complex in the Sioux Narrows area (Brock University).

Kresz, D.V.: Continued a study on volcanism and related mineral deposits in the Kawashegamuk Lake area (Brock University).

Melling, D.: Commenced a study of the geological setting and genesis of the Cameron Lake gold deposit of Nuinsco Resources Limited and Lockwood Petroleum Incorporated (Carleton University).

Stix, John: Continued a study on the transition from lower tholeiitic through to upper calc-alkaline volcanics at Andrew Bay on Lake of the Woods (University of Toronto).

Ph.D.

Poulsen, K.H.: Continued a study of Archean tectonics and mineralization of the Rainy Lake area (Queen's University).

## Ontario Geoscience Research Grant Program

G.R. Edwards (York University) and D.W. Davis (Royal Ontario Museum) commenced a study of the petrogenesis and metallogenesis of the Atikwa-Lawrence volcanic-plutonic terrane.

# Selected Publications Received, 1983

Bjorck, Svante, and Keister, Claire M.
1983: The Emerson Phase of Lake Agassiz, Independently Registered in Northwestern Minnesota and Northwestern Ontario; Canadian Journal of Earth Sciences, Volume 20, Number 10, p.1536-1542.

Blackburn, C.E.
1983: 1982 Report of the Kenora Resident Geologist; p.1-19 *in* Annual Report of the Regional and Resident Geologists, 1982, edited by C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 107, 211p.

Blackburn, C.E., and Janes, D.A.
1983: Gold Deposits in Northwestern Ontario; p.194-210 *in* The Geology of Gold in Ontario, by the Ontario Geological Survey, edited by A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 110, 278p.

Borradaile, Graham John
1982: Comparison of Archean Structural Styles in Two Belts of the Canadian Superior Province; Precambrian Research, Volume 19, p.179-189.

Boulet, R.
1983: Kenora Area Building and Monumental Stone Reconnaissance Project; Tri-Municipal Economic Development Commission, 41p.

Clark, Greg
1983: Kenora Area Mineral Potential; Tri-Municipal Economic Development Commission, 119p.

Danko, J.J.
1983: Geology of Cameron Island and Adjacent Islands: Shoal Lake Area, Northwestern Ontario; B.Sc. Thesis, University of Manitoba, 84p.

Ermanovics, Ingo F., and Wanless, R.K.
1983: Isotopic Age Studies and Tectonic Interpretation of Superior Province in Manitoba; Geological Survey of Canada, Paper 82-12, 22p.

Hodder, R.W., and Petruk, William
1982: Geology of Canadian Gold Deposits; Proceedings of the Canadian Institute of Mining and Metallurgy Gold Symposium, September, 1980, Canadian Institute of Mining and Metallurgy Special, Volume 24, 286p.

Kirkham, R.V., McCann, C., Prasad, N., Soregaroli, A.E., Vokes, F.M., and Wine, G.
1982: Molybdenum in Canada Part 2: Molyfile - An Index-Level Computer File of Molybdenum Deposits and Occurrences in Canada; Geological Survey of Canada, Economic Geology Report 33, 208p.

Kurfurst, P.J.
1983: Summary of 1981 Geotechnical Field Activities at the Research Areas of the Canadian Nuclear Fuel Waste Management Program; Atomic Energy of Canada Limited, TR-208, 22p.

Pedersen, L.S.
1982: Who's Who of the Canadian Nuclear Fuel Waste Management Program; Atomic Energy of Canada Limited, TR-209-1, p.123.

Sabag, Shahe F., and Martin, Robert F.
1983 Metastable Feldspars of Archean Age in the Meggisi Lake Granite, Wabigoon Belt, Ontario; Canadian Mineralogist, Volume 21, p.591-601

Schwerdtner, W.M., Stott, G.M., Sutcliffe, R.H.
1983 Strain Patterns of Crescentic Granitoid Plutons in the Archean Greenstone Terrain of Ontario; Journal of Structural Geology, Volume 5, p.419-430

Setterfield, T., Watkinson, D.M., and Thurston, P.C.
1983 Quench-textured, Pillowed Metabasalts and Copper Mineralization, Maybrun Mine, Northwestern Ontario; Canadian Institute of Mining and Metallurgy Bulletin, Volume 76, No.859, p.69-74

Smith, Duncan Ross
1971 Physical and Chemical Studies of the Salic Volcanic Breccias, Kakagi Lake, Ontario; M.Sc. Thesis, McMaster University, 79p.

Stone, Denver
1981 The Sydney Lake Fault Zone in Ontario and Manitoba, Canada; Ph.D. Thesis, University of Toronto, 146p.

Southwick, D.L., and Day, W.C.
1982 Geology and Petrology of Proterozoic Mafic Dikes, North-Central Minnesota and Western Ontario; Canadian Journal of Earth Sciences, Volume 20, Number 4, p.622-638

Turnock, A.C.
1982 Centre for Precambrian Studies, University of Manitoba, 1982 Annual Report, 160p.

Vadis, M.K., and Meineke, D.G.
1982a Lake Sediment Exploration Geochemical Survey of Portions of Lake and St. Louis Counties, Minnesota; Minnesota Department of Natural Resources, Division of Minerals, Report 171, 31p.

1982b Lake Sediment Geochemical Survey of Cook County, Minnesota; Minnesota Department of Natural Resources, Division of Minerals, Report 138-2, 39p.

Wallace, P.I., and Clifford, P.M.
1983 Kink Folds at Upper Manitou Lake, Northwestern Ontario; Canadian Journal of Earth Sciences, Volume 20, p.1305-1313

Westerman, Christopher John
1977 Tectonic Evolution of a Part of the English River Subprovince, Northwestern Ontario; Ph.D. Thesis, McMaster University, 292p.

# References

Blackburn, C.E., and Hailstone, M.
1983 1982 Report of the Kenora Resident Geologist; p.1-19 *in* Annual Report of the Regional and Resident Geologists, 1982, edited by C.R. Kustra, Ontario Geological Survey, Miscellaneous Paper 107, 211p.

Blackburn, C.E., and Janes, D.A.
1983a Gold Deposits of the Western Wabigoon Subprovince, Northwestern Ontario, and their Metallogeny; Abstract *in* Canadian Institute of Mining and Metallogeny Bulletin, Volume 76, No.851, March, p.71

1983b Gold Deposits in Northwestern Ontario; p.194-210 *in* The Geology of Gold in Ontario, edited by A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 110, 278p.

Lawson, A.C.
1886 Geology of the Lake of the Woods Region; Geological Survey of Canada, Annual Report, New Series, Volume 1, Part CC, 151p.

Storey, C.C.
1983 Preliminary Report of the Building and Ornamental Stone Inventory, Kenora and Rainy River Districts; Ontario Geological Survey, Open File Report 5446, 143p.

# Report of Activities 1983 Red Lake Resident Geologist Area, Northwestern Region

**M.E. Durocher[1] and P.S. Burchell[2]**

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## Introduction

The Red Lake Resident Geologist's Office is presently staffed by M. Durocher, Resident Geologist, P.S. Burchell, Resource Geologist, who joined the staff in May, and C.D. Van Leeuwen, secretary.

## Resident Geologist's Activities

As in previous years, a technical advisory service was provided to companies and individuals engaged in mineral exploration within the Red Lake Mining Division. The number of visitors utilizing this service and other facilities of the office amounted to 1100 during the past year.

Selected mineral properties in the Red Lake "Greenstone Belt" were visited by the staff. A study of the geology and distribution of gold deposits in the Red Lake Belt is in progress, as is a study of the hydrothermal alteration associated with the Madsen, Starratt-Olsen, Hasaga, and Howey former gold producers. Visits were also made to the 3 producing mines in the region.

The Resident Geologist also led several field trips in the Red Lake Belt for industry geologists and student groups. Lectures were organized for a local student group and Junior Rangers.

Assistance and technical comments were provided for several Ministry of Natural Resources programs and land-use studies. Assistance and logistical support were extended to 2 Ontario Geological Survey field parties active in the Red Lake Mining Division in 1983.

## Mining Activity

Three mines were in production during 1983 (Figure 2). A summary of the main developments of the various operations follows. The cooperation of the mine manager of each operation in providing the following information is gratefully acknowledged.

### Campbell Red Lake Mines Limited

Campbell Red Lake Mines Limited operated throughout 1983. The company has completed construction of a new refinery, and renovation of surface buildings. Underground exploration in 1983 has been directed at extending known ore zones and maintaining ore reserves. The mine manager is S.M. Reid.

### Dickenson-Sullivan Group Joint Venture

The Arthur White Mine operated continuously throughout 1983. The company has completed the first phase of its expansion program, and production has increased from

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[1]Resident Geologist, [2]Resource Geologist, Ontario Ministry of Natural Resources, Red Lake.

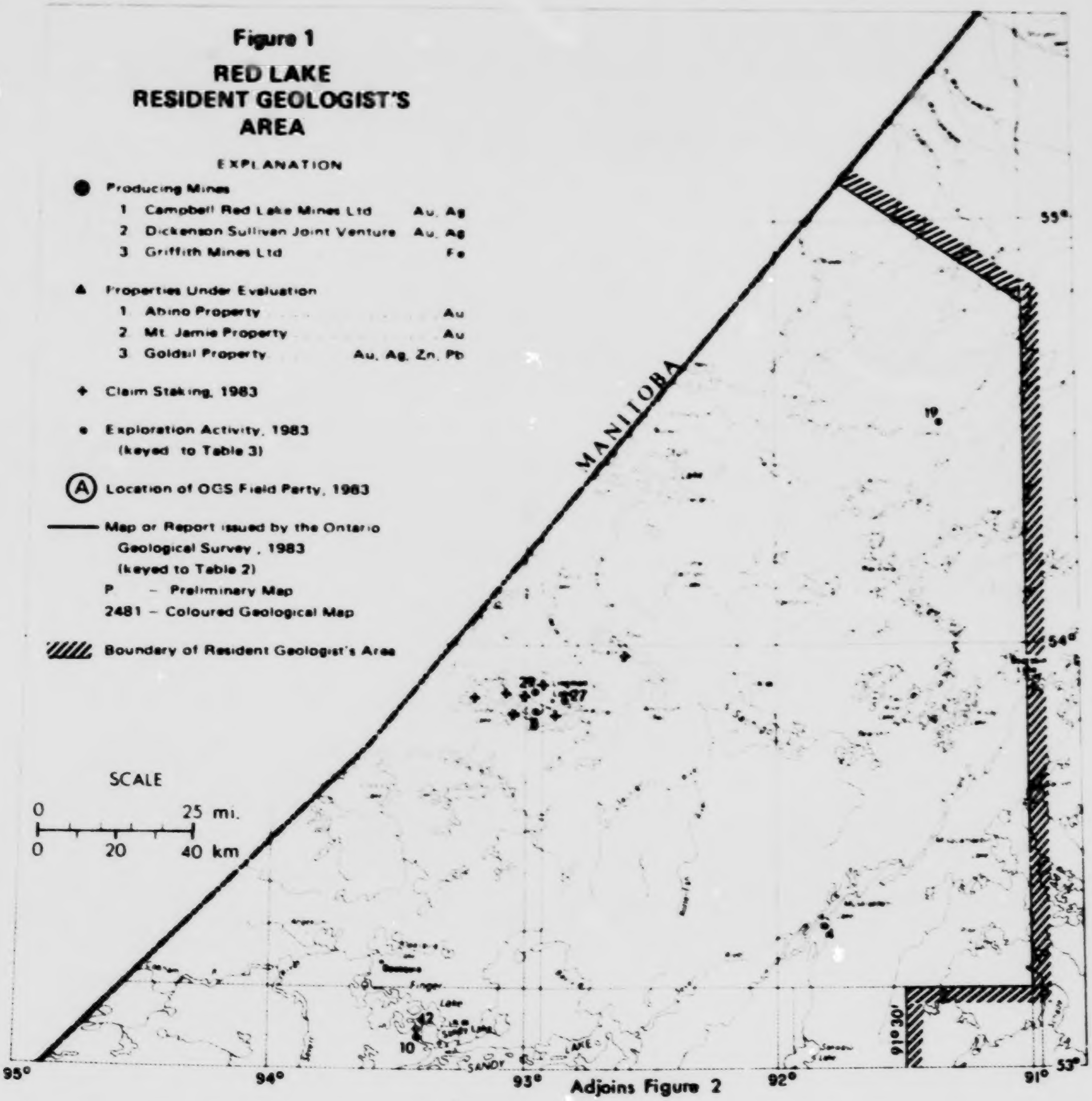
EXPLANATION
● Producing Mines
1 Campbell Red Lake Mines Ltd Au, Ag
2 Dickenson Sullivan Joint Venture Au, Ag
3 Griffith Mines Ltd Fe
▲ Properties Under Evaluation
1 Abino Property Au
2 Mt. Jamie Property Au
3 Goldsil Property Au, Ag, Zn, Pb
✦ Claim Staking, 1983
• Exploration Activity, 1983 (keyed to Table 3)
Ⓐ Location of OGS Field Party, 1983
Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 2)
P – Preliminary Map
2481 – Coloured Geological Map
▨ Boundary of Resident Geologist's Area
SCALE
0
25 mi.
0
20
40 km
MANITOBA
55°
54°
53°
19
29
27
12
10
Finger
Lake
SANDY
LAKE
91° 30'
95°
94°
93°
92°
91°

**Figure 1**

**RED LAKE RESIDENT GEOLOGIST'S AREA**

Adjoins Figure 2

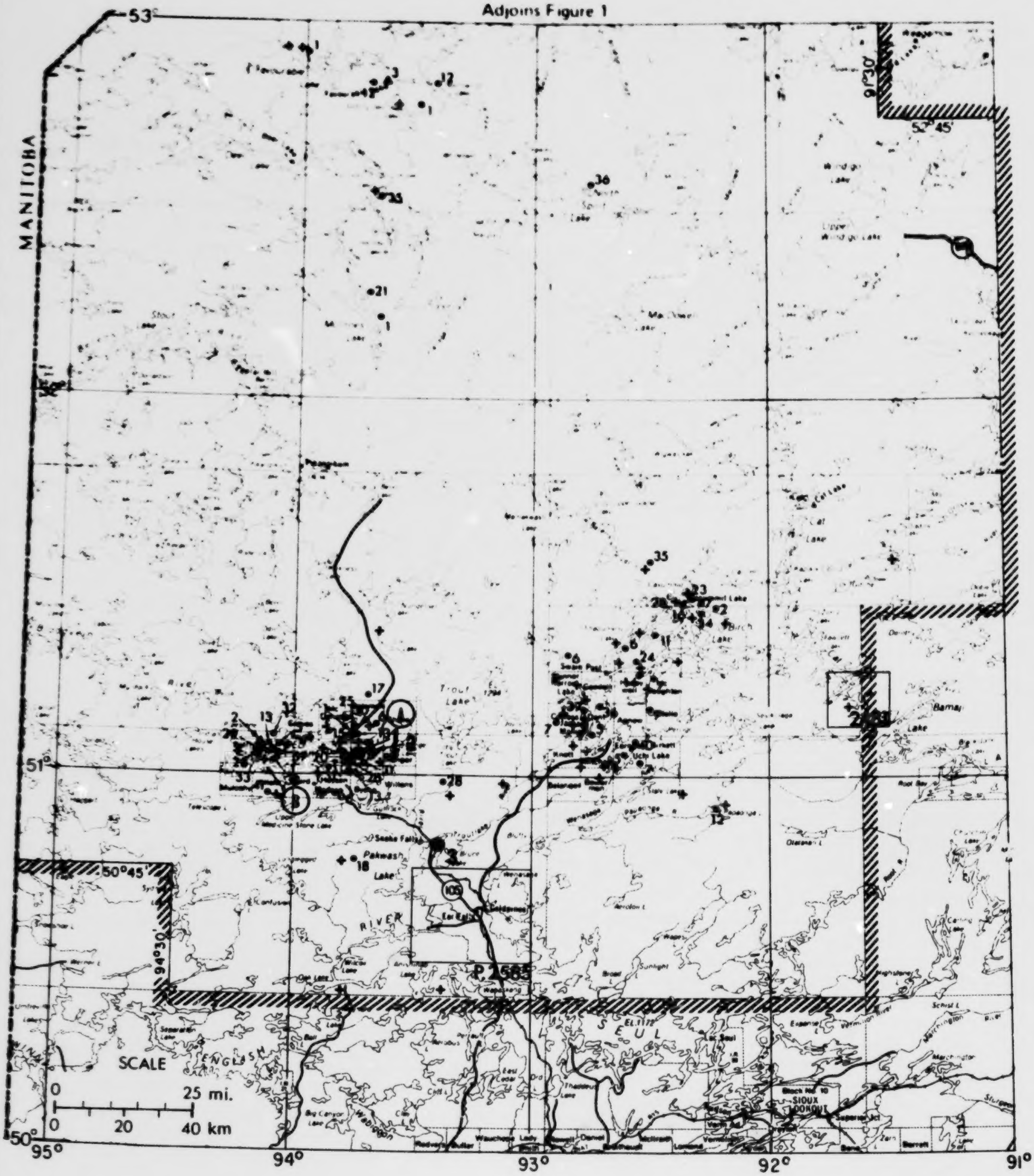
Adjoins Figure 1
53°
MANITOBA
91°30'
52°45'
Upper Windigo Lake
Cat Lake
Trout Lake
Birch Lake
Bamaji Lake
51°
Snake Falls
Pakwash Lake
50°45'
94°30'
RIVER
Ear Falls
P.2565
ENGLISH
SEUL
SIOUX LOOKOUT
SCALE
0
25 mi.
0
20
40 km
50°
95°
94°
93°
92°
91°

Figure 2

500 to 700 tons per day. Underground developments in 1983 consisted of revitalizing the #2 shaft with drifting on 3 levels. Underground exploration has been directed at extending known ore zones, and maintaining ore reserves. P. Busse is the mine manager.

## Griffith Mine

The Griffith Mines, a wholly owned subsidiary of the Steel Company of Canada Limited and managed by Picklands Mather and Company, is situated at Bruce Lake 50 km southeast of Red Lake. During the first 5 months of 1983, the mine operated at ⅔ capacity. Following a 3-month shutdown in the summer it resumed production at ⅔ capacity for the remainder of the year. J. Jeffries is the mine manager.

## Exploration Activity

Exploration activity during 1983 in the Red Lake Mining Division was lower than in 1982.

Claims recorded up to November 30, 1983, increased by 266% as compared with 1982 (Table 1), and the number of active claims increased by 164% as compared to 1982. Between January 1 and November 30, 1983, 46 289 man-days of assessment work were filed as compared to 118 775 man-days in 1982, a decrease of 61%.

Much of the exploration activity was concentrated in the Red Lake Metavolcanic Belt, with lesser amounts of exploration taking place in the Uchi-Confederation Lakes, Birch Lake, Favourable Lake, and North Spirit Lake Metavolcanic Belts (Figures 1 and 2).

No new orebodies were discovered in 1983, but several past producers and prospects are being re-evaluated.

Wright Engineering Limited has completed a feasibility study of the Berens River Mine, a former gold-silver producer in the Favourable Lake Metavolcanic Belt. The study was commissioned by Getty Canadian Metals Limited, and Zahavy Mines Limited. Reserve estimates to 600 m below surface are 475 000 tons of 0.336 ounce gold equivalent per ton (Northern Miner, July 28, 1983, p.3). No additional work is planned in the immediate future.

Keeley Frontier Resources Limited are re-evaluating the Mount Jamie Property in Todd Township in the Red Lake Metavolcanic Belt. Their program involves surface stripping, geological mapping, and surface and underground diamond drilling. They are currently assessing the results of this work.

Sabina Industries Limited has done considerable work on the McFinley Prospect in Bateman Township in the Red Lake "Greenstone Belt". Their recent diamond-drill program has increased ore reserves on the property to 426 374 tons grading 0.44 ounce gold per ton, and 1.09 ounces silver per ton (Northern Miner, October 13, 1983, p.1).

Goldquest Exploration Incorporated is evaluating the results of their underground exploration program on the Abino Prospect in Balmer and Bateman Townships, and of their surface exploration program on their Lake Rowan Prospect in Todd Township. Exploration on the Abino Property involved driving a 500-metre decline, and underground diamond drilling. Exploration on the latter property involved surface stripping, geological mapping, and sampling.

## Properties Visited

In 1983, the following gold occurrences, prospects, and properties were visited by staff of the Red Lake Resident Geologist's Office:

1. Madsen and Starrat-Olsen Properties—Baird Township
2. Buffalo Prospect—Heyson Township
3. Howey and Hasaga Properties—Heyson Township
4. Skookum Bay Prospect—Dome Township
5. Keeley Frontier Property—Todd Township
6. Lake Rowan Prospect—Todd Township
7. Martin Bay Occurrences—Todd Township
8. Wolf Bay Prospect—Todd Township
9. Luxor Red Lake Property—McDonough Township
10. McFinley Prospect—Bateman Township
11. Abino Prospect—Bateman and Balmer Townships
12. Laird Lake Occurrences—Killala Township

## Ontario Geological Survey Activities

The following projects were carried out by the Ontario Geological Survey in 1983 (for location of the projects *see* Figures 1 and 2).

The Red Lake Synoptic Project continued during the 1983 field season. The objective of this project is a comprehensive tectonic, stratigraphic, and metallogenic synthesis of the Red Lake "Greenstone Belt" (Wallace 1982).

A.J. Andrews continued a multi-year project to study the nature of alteration associated with gold deposits. This project will involve petrological, geochemical, and structural studies. The study will yield valuable information on the mechanisms of ore genesis, processes of metal transport, and the history of ore deposition. It will also aid in the identification of lithogeochemical characteristics useful in exploration for gold deposits (Andrews 1983).

For additional information on the above listed projects, the reader is referred to the Summary of Field Work, 1983, by the Ontario Geological Survey (Wood *et al.* 1983).

TABLE 1

SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

| Year | Claims Recorded | Claims Cancelled | Claims Active | Diamond Drilling (Man Days) | Geophysical Surveys (Man Days) | Geological Surveys (Man Days) | Other Man Days. | Total Man Days |
|---|---|---|---|---|---|---|---|---|
| 1983 | 2,499 | 1,211 | 6,564 | 18,486 | 16,956 | 2,040 | 8,807 | 46,289 |
| 1982 | 942 | 1,884 | 3,992 | 23,967 | 79,662 | 6,787 | 8,359 | 118,775 |
| 1981 | 1,719 | 1,249 | 4,880 | 28,771 | 66,000 | 8,182 | 4,477 | 107,430 |
| 1980 | 2,220 | 1,115 | 4,301 | 38,482 | 30,240 | 871 | 2,382 | 71,975 |
| 1979 | 1,068 | 1,763 | 3,221 | 21,108 | 38,380 | 3,154 | 307 | 62,949 |
| 1978 | 1,207 | 1,521 | 3,916 | 25,574 | 19,496 | 2,480 | 3,447 | 50,997 |
| 1977 | 2,324 | 2,395 | 4,261 | 12,994 | 45,080 | 620 | 502 | 59,196 |
| 1976 | 2,705 | 1,382 | 4,332 | 18,680 | 23,578 | 380 | 3,906 | 46,544 |
| 1975 | 1,368 | 2,059 | 2,057 | 29,377 | 12,714 | 960 | 1,666 | 44,717 |
| 1974 | 1,339 | 1,820 | 3,648 | 47,362 | 5,660 | 3,040 | 1,657 | 57,719 |
| 1973 | 1,616 | 3,157 | 4,009 | 60,027 | 20,474 | nil | 2,518 | 83,019 |
| 1972 | 2,219 | 5,284 | 5,588 | 34,261 | 14,858 | 5,216 | 1,838 | 56,173 |
| 1971 | 1,541 | 4,922 | 8,486 | 73,019 | 50,920 | 2,243 | 1,384 | 127,566 |
| 1970 | 3,971 | 7,194 | 11,759 | 73,866 | 329,065 | 17,606 | 6,990 | 427,527 |
| 1969 | 10,999 | 933 | 14,772 | 49,212 | 66,032 | 1,320 | 2,475 | 119,039 |
| 1968 | 2,451 | 1,702 | 4,784 | 15,367 | 48,800 | 1,228 | nil | 65,395 |

January 1, 1983 - November 30, 1983 inclusive.

## Ontario Mineral Exploration Program

During 1983, 4 OMEP grants totalling $377 587 were awarded for designated exploration programs in the Red Lake Mining Division.

## Research by Other Agencies

In conjunction with the Ontario Geological Survey's Geoscience Research Grant Program, H. Hugon and W.M. Schwertdner from the University of Toronto initiated a detailed structural study of the Flat Lake-Hovey Bay Deformation Zone.

P. Berger and J.M. Summers from Queen's University initiated a structural study of an area in Dome and McDonough Townships which includes parts of the Post Narrows and Cochenour-Dickenson Deformation Zones.

M. Sandborn of the University of Toronto conducted a detailed structural study in selected parts of the Cochenour Willans Mine.

B. Wilson of Queen's University initiated a multi-year structural study of the Red Lake metavolcanic belt.

In cooperation with the Ontario Geological Survey's programs in the Red Lake area, F. Corfu from the Royal Ontario Museum in Toronto collected a suite of specimens for U-Pb zircon analysis. The objective of this study is to determine the timing of gold mineralization in the Red Lake Belt.

S. Noble and N. Evanson from the University of Toronto initiated a multi-year isotopic study of felsic volcanic rocks in the Uchi-Confederation Belt and nearby granitic intrusions.

P. Brown, and J. Lakind, from the University of Wisconsin in Madison, sampled quartz veins in several felsic intrusions in the Red Lake Belt for fluid inclusions and stable isotope studies.

TABLE 2 MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES

Ontario Geological Survey Reports

Open File Reports
OFR 5441
OFR 5447

Preliminary Maps - Geological Series

Preliminary Maps - Data Series

Aggregate Resources Publications
P.2585

Federal - Provincial Maps

Coloured Maps
Map 2491

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports
MP-107
MP-110
MP-116

Geological Survey of Canada Open File Reports

## Selected Recent Publications and References

Andrews, A.J.
1983: Alteration, Metamorphism, and Structure Associated with Archean, Volcanic-Hosted Gold Deposits, Red Lake District; p.211-215 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Andrews, A.J., and Durocher, Marcel E.
1983: Gold Studies in the Red Lake Area; p.207-210 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Andrews, A.J., and Wallace, H.
1983: Alteration, Metamorphism, and Structural Patterns Associated with Archean Gold Deposits—Preliminary Observations in the Red Lake Area; p.111-122 *in* The Geology of Gold in Ontario, edited by A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 110, 278p.

Berger, P., and Summers, J.M.
1983: Structural Studies in Dome and McDonough Townships, Red Lake Area; p.227-228 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Durocher, M.E.
1983: The Nature of Hydrothermal Alteration Associated with the Madsen and Starratt-Olsen Gold Deposits, Red Lake Area; p.123-140 *in* The Geology of Gold in Ontario, edited by A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 110, 278p.

Durocher, Marcel E., and Burchell, P.
1983: Structural Geology and Hydrothermal Alteration, Metamorphism, and Gold Mineralizaiton in the Pipestone Bay-St. Paul Bay Deformation Zone, Red Lake; p.220-223 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

TABLE 3

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Amoco Canada Petroleum Limited | Diamond drilling in McInnes, Setting Net and Borland Lakes areas; geological mapping, linecutting, VLF-EM and magnetometer surveys in Borland Lake; exploration in Favourable Lake area. |
| 2 | Bennie, John | Exploration in the Birch Lake area. |
| 3 | Bluestack Resources Limited | Trenching, and sampling in Bateman and McDonough Townships. |
| 4 | Canoxy (Canadian Occidental Petroleum Limited) | Exploration in the Sandy Lake area. |
| 5 | Consolidated Orofino Resources | Exploration in Todd, Earngey and Dent Townships. |
| 6 | Desmeules, Marc | Prospecting in Heyson, Bateman and Fairlie Townships and in the Shabumeni Lake area. |
| 7 | Dome Exploration (Canada) Limited | Diamond drilling in Dome Township; exploration in the Uchi-Confederation greenstone belt and in Ball Township. |
| 8 | Eldor Resources Limited | Diamond drilling in Balmer and Sanger Townships; EM and magnetometer surveys in Seeber and Lingman Lakes areas. |
| 9 | Frank, Raymond | Diamond drilling and trenching in Dent Township. |
| 10 | Gay, Edward | Diamond drilling in the Sandy Lake area. |
| 11 | Geddes Resources/St. Joe Canada Inc. | Diamond drilling in Dent Township. |
| 12 | Getty Mines Limited | Exploration in Avis and Papaonga Lakes areas; feasibility studies and geochemistry and diamond drilling in the Setting Net Lake area; underground exploration and diamond drilling in the South Trout Lake area. |
| 13 | Goldquest Exploration Inc. | Diamond drilling, geological mapping, and radiometric survey in Balmer Township; diamond drilling and underground exploration in Bateman Township; surface stripping, geological mapping in Todd Township; geological mapping and geophysical surveys in Byshe Township. |
| 14 | Green, John A. | Trenching and sampling in Honeywell Township. |
| 15 | Hager Andrew | Prospecting in the Red Lake area. |
|  | Hager, Andrew | Prospecting in the Red Lake area. |
| 16 | Heinrich, Bradley | Stripping, trenching and sampling in the Casummit Lake area. |
| 17 | Herbert, Larry | Prospecting in Little Vermillion Lake area. |
| 18 | Hermiston, Wayne | Prospecting in the Dedee Lake area. |
| 19 | Hunt, C.Warren | Diamond drilling in the Aljo Lake area. |
| 20 | Huston, Cark | Diamond drilling in Dome and Balmer Townships. |
| 21 | Johnson, Myles | Prospecting in the McInnes Lake area. |
| 22 | Keeley Frontier Mines Limited | Surface mapping, stripping, underground diamond drilling, in Todd Township. |
| 23 | Kostynuk Brothers | Prospecting in the Casummit Lake area. |
| 24 | Labrador Exploration (Ontario) Limited | Prospecting in the Shabumeni Lake area. |
| 25 | McFinley Mines Limited/Sabina Industries Limited | Diamond drilling in Bateman Township. |
| 26 | McNerney, William | Stripping and sampling in Balmer Township. |
| 27 | Neartic Resources | Diamond drilling in the Lingman Lake area. |
| 28 | Noranda Exploration Company, Limited | Diamond drilling in Todd Township; explortion in Abate, Casummit, and Brownstone Lakes areas; EM and magnetometer surveys in Mattson and Armstrong Lakes area. |
| 29 | Parcey, Steve | Staking in North of Lingman Lake area. |
| 30 | Penway Resources | Diamond drilling in Bateman Township. |
| 31 | Peterson, Charles W. | Prospecting, surface stripping and trenching in Dome Township; prospecting in Balmer Township, |
| 32 | Pipestone Bay Resources Limited | Geophysical surveys, geological surveys, and diamond drilling in Todd Township. |
| 33 | Rivard O'Brien | Diamond drilling and prospecting in Todd Township. |
| 34 | St. Joe Exploration | Exploration and geological mapping in the Birch Lake area; exploration in the Satterly Lake area; and diamond drilling at Casummit and Satterly Lakes areas. |
| 35 | Sanderson, Allen | Prospecting in the Hornby and Blondin Lakes area |

TABLE 3 Continued

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 36 | Selco Inc. | Reconnaissance exploration in the eastern Uchi greenstone belt and North Spirit belt. |
| 37 | Sherritt Gordon Mines Limited | Diamond drilling in Dent Township. |
| 38 | Soltermann, Rene | Diamond drilling in Todd Township. |
| 39 | Strilchuk, Gerry | Prospecting in Todd Township. |
| 40 | Terrell, W. | Prospecting in the Uchi Lake area |
| 41 | Tetlock, Ian | Surface exploration in the Laird Lake area. |
| 42 | Wavano Resources Limited | Diamond drilling in the Granite Bay of Sands Lake area. |

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Wood, J., White, O.L., Barlow, R.B., and Colvine A.C.

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TABLE 4

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

| | |
|---|---|
| Au | Gold |
| AEM | Airborne Electromagnetometer Survey |
| AMag | Airborne Magnetometer Survey |
| Assess | Assessment |
| BM | Base Metals |
| DDH | Diamond Drill Hole |
| EM | Electromagnetometer Survey |
| FF-EM | Fraser-Filter Electromagnetometer Survey |
| G | Ground Survey |
| geochem | Geochemistry |
| Gl | Geological Survey |
| HLEM | Horizontal Loop Electromagnetic Survey |
| l-geochem | Geochemical Lithogeochemistry |
| Mag | Magnetometer Survey |
| | Orthophotogrammetry |
| OVG | Overburden Geochemistry |
| OVD | Overburden Drilling |
| Rad | Radiometric Survey |
| SA | Sampling, Assays |
| SP | Self Potential |
| sTr | Stripping, Soil Trenching |
| Tr | Trenching |
| rTr | Rock Trenching |
| VEM | Vertical Electromagnetometer Survey |
| VLF-EM | Very Low Frequency Electromagnetometer Survey |

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Aljo Lake | 53I/11 | Hunt, C.Warren | Au,Ag,Cu<br>Ni,Pb,Zn | Assess | OV Geochem, l-geochem | 1981 | 2.4992 | 53I NW |
| Aljo Lake | 53I/11 | Hunt, C.Warren | Au | Assess | DDH(6) 2000' | 1981 | | 53I NW |
| Baird, Fairlie Tps. | 52K/4,11 | Selco Inc. | Au | Assess | VLF-EM | 1981 | 2.4723 | Baird |
| Balmer Tp. | 52N/4 | Eldorado Nuclear Limited | Au | Assess | Gl | 1980 | 2.4722 | Balmer |
| Balmer Tp. | 52N/4 | Eldorado Nuclear Limited | Au | Assess | Gl | 1982 | 2.4704 | Balmer |
| Balmer,Ranger Tps. | 52N/4 | Eldor Resources Limited | Au | Assess | DDH(7) 1424' | 1981 | | Ranger |
| Balmer Tp. | 52N/4 | Gold Fields Resources Canada Limited | Au | Assess | Mag, EM | 1981 | 2.4215 | Balmer |
| Balmer Tp. | 52N/4 | Goldquest Exploration Inc. | Au | Assess | HLEM,Mag | 1981 | 2.5410 | Balmer |
| Balmer Tp. | 52N/4 | Goldquest Exploration Inc. | Au | Assess | DD,SA | 1980 | | Balmer |
| Balmer Tp. | 52N/4 | Goldquest Exploration Inc. (Dickenson Mines) | Au | Assess | HLEM,Mag | 1981 | 2.5411 | Balmer |
| Bateman Tp. | 52N/4 | Betos Management Limited | Au | Assess | VLF-EM | 1981 | 2.4712 | Bateman |
| Bateman Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | Mag | 1980 | 2.3620 | Bateman |
| Bateman Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | DDH(4) 1571' | 1982 | - | Bateman |
| Bateman Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | HLEM | 1981 | 2.4411 | Bateman |
| Bateman Tp. | 52N/4 | Dome Exploration (Canada) Limited | Au | Assess | EM,Mag | 1981<br>1982 | 2.4859 | Bateman |
| Bateman,McDonough Tp | 52N/4 | Gold Fields Canadian Mining Limited | Au | Assess | VLF-EM,Mag | 1982 | 2.5124 | McDonough |
| Bateman Tp. | 52N/4 | Goldquest Exploration Inc. | Au | Assess | DDH(4) 1334' | 1983 | - | Bateman |
| Bateman Tp. | 52N/4 | Penway Explorers Limited | Au | Assess | DDH(4) 2044' | 1983 | - | Bateman |
| Bateman Tp. | 52N/4 | Sabina Industries Limited | Au | Assess | geochem, Gl | 1981 | 2.4039 | Bateman |
| Bateman Tp. | 52N/4 | Sabina Industries Limited | Au | Assess | EM,Mag | 1982 | 2.4068 | Bateman |
| Bateman Tp. | 52N/4 | Sabina Industries Limited | Au | Assess | DDH(1) 699.1' | 1983 | - | Bateman |
| Bateman Tp. | 52N/4 | Sabina Industries Limited | Au | Assess | DDH(1) 242.9' | 1983 | - | Bateman |
| Bateman Tp. | 52N/4 | Teck Exploration Limited | Au | Assess | VLF-EM,CEM,Mag, drafting | 1981 | 2.3848 | Bateman |
| Birkett Tp. | 52N/1 | Lee, Norman | Au | Assess | rTr | 1982 | - | Birkett |
| Birkett Tp. | 52N/1 | Lee, Norman | Au | Assess | rTr | 1983 | - | Birkett |
| Borland Lake | 53D/16 | Amoco Canada Petroleum Company Limited | Au | Assess | DDH(2) 929' | 1983 | - | 53D/NE |
| Borland Lake | 53D/16 | Noranda Exploration Company Limited | Au | Assess | HLEM, Mag | 1981 | 2.4391 | 53D/NE |

TABLE 6 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Bowerman Tp. | 52N/11 | Selco Mining Corporation Limited | Au | Assess | HLEM, Mag | 1979<br>1980 | 2.3290 | Bowerman |
| Brownstone, Casummit Lakes | 52N/7<br>52N/8 | Noranda Exploration Company Limited | Au | Assess | HEM, Mag | 1981 | 2.4192 | 52N/SE |
| Burkett Lake | 53C/10 | Esso Resources Canada Limited | Au | Assess | Mag | 1982 | 2.5178 | 53C/NW |
| Brahe Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | HLEM | 1981 | 2.4711 | Brahe |
| Brahe Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | Mag | 1981 | 2.4723 | Brahe |
| Casummit Lake | 52N/9 | Heinrich, Bradley | Au | Assess | SA | 1981 |  | 52N/SE |
| Casummit Lake | 52N/9 | Heinrich, Bradley | Au | Assess | rTr | 1981 |  | 52N/SE |
| Casummit Lake | 52N/9 | Koatsnub, Alexander | Au | Assess | GI | 1981 | 2.4551 | 52N/SE |
| Casummit, Batterly Lakes | 52N/8 | St. Joe Canada Inc. | Au | Assess | DDH(5) 1266' | 1981 |  | 52N/SE |
| Corless Tp. | 52N/2 | Aladin Minerals Limited (C.M. Hames) | Au | Assess | GI, SP | 1982 | 2.4952 | Corless |
| Corless Tp. | 52N/2 | Aladin Minerals Limited (C.M. Hames) | Au | Assess | DD, SA | 1982 |  | Corless |
| Dent Tp. | 52N/2 | Desmeules M. (Sherritt Gordon) | Au | Assess | rTr | 1981 |  | Dent |
| Dent Tp. | 52N/2 | Frank, Raymond | Au | Assess | rTr, STr | 1982 |  | Dent |
| Dent Tp. | 52N/2 | Frank, Raymond | Au | Assess | rTr, STr | 1981 | - | Dent |
| Dent Tp. | 52N/2 | Gold Fields Canadian Mining Company Limited | Au | Assess | GI | 1982 | 2.5430 | Dent |
| Dent Tp. | 52N/2 | Gold Fields Resources Canada Limited | Au | Assess | HLEM, Mag | 1982 | 2.4284 | Dent |
| Dent Tp. | 52N/2 | Sherritt Gordon Mines Limited | Au | Assess | EM, Mag | 1981<br>1982 | 2.4797 | Dent |
| Dent Tp. | 52N/2 | Sherritt Gordon Mines Limited | Au | Assess | DDH(4) 336' | 1983 | - | Dent |
| Dome Tp. | 52N/4 | Dome Exploration (Canada) Limited | Au | Assess | DDH(1) 207' | 1983 | - | Dome |
| Dome Tp. | 52N/4 | Gold Fields Canadian Mining Company Limited | Au | Assess | GI | 1982 | 2.5376 | Dome |
| Dome Tp. | 52N/4 | Gold Fields Canadian Mining Company Limited | Au | Assess | rTr, Str | 1981 | - | Dome |
| Dome, Fairlie Tps. | 52N/4 | Gold Fields Canadian Mining Company Limited | Au | Assess | VLF-EM | 1981 | 2.4317 | Dome |
| Dome, Heyson Tps. | 52N/4<br>52K/13 | Peterson, C.W. | Au | Assess | VLF-EM | 1981 | 2.4044 | Dome |
| Dome, McDonough Tps. | 52N/4 | Bluestack Resources Limited | Au | Assess | Mag | 1981 | 2.4230 | Dome |
| Fairlie Tp. | 52N/4 | Gold Fields Resources Canada Limited | Au | Assess | FF-EM, Mag | 1980<br>1981 | 2.4154 | Fairlie |
| Failrie Tp. | 52N/4 | Gold Fields Resources Canada Limited | Au | Assess | Mag. | 1980<br>1981 | 2.4023 | Fairlie |
| Fairlie Tp. | 52N/4 | Minorex Limited | Au | Assess | GI | 1981 | 2.3753 | Fairlie |
| Fairlie | 52N/4 | Minorex Limited | Au | Assess | VLF-EM | 1981 | 2.4125 | Fairlie |
| Fairlie Tp., Hammell Lake | 52N/4<br>52M/1 | Canadian Nickel Company, Limited | Au | Assess | AEM, AMag, Rad | 1982 | 2.4883 | 52M/SE |
| Granite Bay of Sandy Lake | 53F/3 | Canadian Occidental Petroleum, Limited | Au | Assess | GI | 1982 | 2.5339 | 53F/SW |
| Granite Bay of Sandy Lake | 53F/3 | Wavano Explorations Inc. | Au | Assess | DDH(10) 2131' | 1983 | - | 53F/SW |

TABLE 6 Continued

| Locations | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Granite Bay of Sandy Lake | 53F/3 | Wasamo Explorations Inc. | Au | Assess | EM | 1981 | 2.5407 | 53F SW |
| Granite Bay of Sandy, Kakapitam, Sandy Lakes | 53F/7 | Canadian Occidental Petroleum, Limited | Au | Assess | VLF-EM, Mag | 1982 | 2.4978 | 53F SE |
| Goodall Tp. | 52N/2 | Minorex Limited | Au | Assess | VLF EM | 1980 | 2.4110 | Goodall |
| Goodall Tp. | 52N/2 | Minorex Limited | Au | Assess | VLF EM | 1981 | 2.3754 | Goodall |
| Hammell Lake | 52M/1 | Dickenson Mines Limited | Au | Assess | HLEM, Mag | 1982 | 2.5000 | 52M SE |
| Hammell Lake | 52M/1 | Goldquest Exploration Inc. | Au | Assess | ETr | 1981 | | 52M SE |
| Hammell Lake | 52M/1 | Goldquest Exploration Inc. | Au | Assess | ETr | 1981 | | 52M SE |
| Hammell Lake | 52M/1 | Mount Jamie Mines Limited | Au | Assess | Mag | 1981 | 2.3892 | 52M SE |
| Hammell Lake | 52M/1 | Rivard, Danny | Au | Assess | DDH(1) 240' | 1982 | | 52M SE |
| Hammell Lake | 52M/1 | Rivard, Danny | Au | Assess | DDH(1) 170' | 1981 | | 52M SE |
| Hammell Lake | 52M/1 | Soltermann, Rene | Au | Assess | DDH(1) 598' | 1982 | | 52M SE |
| Hammell Lake | 52M/1 | Soltermann, Rene | Au | Assess | DDH(1) 620' | 1983 | | 52M SE |
| Hayward Lake | 53C/12 | B.P. Minerals Limited | Au | Assess | GI | 1981 | 2.4197 | 53C NW |
| Hewitt Lake | 53C/7 | Esso Resources Canada Limited | Au | Assess | GI, geophys | 1982 | 2.5150 | 53C SE |
| Honeywell Tp. | 52N/2 | Green, John A. | Au | Assess | ETr | 1982 | 2.5150 | Honeywell |
| Honeywell Tp. | 52N/2 | Sherritt Gordon Mines Limited | Au | Assess | Mag | 1980 | 2.4225 | Honeywell |
| Kakapitam Lake | 53F/3 | Canadian Occidental Petroleum, Limited | Au | Assess | GI, SA | 1982 | 2.5340 | 53F SW |
| Kippen Lake | 53C/3 | Canadian Occidental Petroleum, Limited | Au | Assess | EM, Mag | 1981 | 2.5124 | 53C SW |
| Lingman, North of Lingman Lakes | 53F/15 | Amoco Canada Petroleum Company Limited | Au | Assess | EM, Rad, Mag, geochem, SA, GI | 1981 | 2.3694 | 53F NE |
| Lingman, North of Lingman Lakes | 53F/15 | Amoco Canada Petroleum Company Limited | Au | Assess | GI, geochem, EM, Mag, SA | 1981 | 2.3843 | 53F NE |
| Meen Lake | 52O/6 | Cominco Limited | Au | Assess | Mag, EM | 1979 | 2.3237 | 52O SW |
| McDonough Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | DDH(2) 750' | 1982 | | McDonough |
| McDonough Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | Mag, HLEM | 1981 | 2.4750 | McDonough |
| McDonough Tp. | 52N/4 | Dickenson Mines Limited | Au | Assess | Rad, GI | 1982 | 2.5323 | McDonough |
| McDonough Tp. | 52N/4 | Gold Fields Canadian Mining Limited | Au | Assess | Mag | 1981 | 2.4240 | McDonough |
| McDonough Tp. | 52N/4 | Goldquest Exploration Inc. | Au | Assess | DDH(2) 1060' | 1983 | - | McDonough |
| Nango, Yovoy Lakes | 53B/6<br>53B/12 | Dome Exploration (Canada) Limited | Au | Assess | AEM, AMag | 1981 | 2.5399 | 53B/NW |
| North Trout Lake | 53C/13 | Getty Canadian Metals, Limited | Au | Assess | GI | 1981 | 2.5387 | 53C/NW |
| North Trout, Setting Net Lakes | 53C/13 | Getty Canadian Metals, Limited | Au | Assess | EM, Mag | 1981 | 2.4922 | 53C/NW |
| North Trout, Setting Net Lakes | 53C/13 | Getty Canadian Metals, Limited | Au | Assess | GI, SA | 1982 | 2.5388 | 53C/NW |
| North Trout, Setting Net Lakes | 53C/13 | Getty Canadian Metals, Limited | Au | Assess | GI, SA, geochem, Air Photos | 1981 | 2.4602 | 53C/NW |
| Otter Lake | 52N/3 | Gold Fields Resources Canada Limited | Au | Assess | HLEM | 1981 | 2.4225 | 52N/SW |

**TABLE 4 Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Otter, South of Otter Lakes | 52N 3<br>52K 14 | Gold Fields Resources Canada Limited | Au | Assess | Mag, EM | 1981 | [illegible] | 52K NW |
| Falsen Lake | 53C 1 | Meekis, Daniel | Au | Assess | GI, geochem, EM, Mag | 1982 | [illegible] | 53C SE |
| Rahill Lake | 53C 2 | Canadian Occidental Petroleum Limited | Au | Assess | GI | 1982 | [illegible] | 53C SE |
| Rahill Lake | 53C 2 | Canadian Occidental Petroleum Limited | Au | Assess | GI, SA | 1982 | [illegible] | 53C SE |
| Rahill Lake | 53C 2 | Canadian Occidental Petroleum Limited | Au | Assess | GI | 1982 | [illegible] | 53C SE |
| Setting Net Lake | 52N 13 | Getty Canadian Metals, Limited | Au | Assess | GI, geophys, SA orthophotogram. | 1981 | [illegible] | 52N NW |
| Setting Net Lake | 52N 13 | Getty Canadian Metals, Limited | Au | Assess | GI, SA | 1982 | [illegible] | 52N NW |
| Shabumeni Lake | 52N 7 | Sanderson, Allen (Minorex Limited) | Au | Assess | EIS, EM | 1981 | [illegible] | 52N SE |
| Shabumeni Lake | 52N 7 | Sherritt Gordon Mines Limited | Au | Assess | Mag, EM | 1981 | [illegible] | 52N SE |
| Shabumeni Lake | 52N 7 | Sherritt Gordon Mines Limited | Au | Assess | Mag | 1981 | [illegible] | 52N SE |
| Slate Lake | 52K 13 | Ouellette, Pierre (St. Joseph Exploration Limited) | Au | Assess | HLEM, Mag | 1982 | [illegible] | 52K NW |
| South of Otter Lake | 52K 14 | Gold Fields Resources Canada Limited | Au | Assess | HLEM, Mag | 1981<br>1982 | [illegible] | 52K NW |
| South of Otter Lake | 52K 14 | Gold Fields Resources Canada Limited | Au | Assess | HLEM, Mag | 1980<br>1981 | [illegible] | 52K NW |

# Report of Activities 1983
# Sioux Lookout Resident Geologist Area, Northwestern Region

**D.A. Janes[1] and R.B. Huggins[2]**

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## Introduction

The Sioux Lookout Resident Geologist's Office is presently staffed by Don Janes, Resident Geologist, Ralph Huggins, Resource Geologist, and Mary Sawtelle, Geological Secretary.

As in the rest of Ontario, exploration activity in the Patricia Mining Division was almost exclusively based on gold and silver. Only 2 base-metal projects were undertaken within the Resident Geologist's area, and these were continuations of existing programs.

Precious metals exploration was widely based throughout the Mining Division but was intense in several areas, particularly around Sturgeon Lake and Savant Lake.

Goldlund Mines Limited, after a period of production in their mill, appear to have solved their technical and financial problems, with the conclusion of a management agreement with Campbell Resources Incorporated. A GOMILL custom milling agreement has been concluded with the Ontario Ministry of Natural Resources and the mill should be ready to accept custom ore in the new year.

The Mattabi and Lyon Lake Mines on Sturgeon Lake have remained in production in 1983 and expect to operate profitably in 1984.

Unfortunately, the Thierry Mine (UMEX Incorporated) at Pickle Lake is still in care and maintenance status and will remain in this status in 1984.

## Resident Geologist's Activities

All operating mines in the mining division were visited during the year. The Resident Geologist spent several weeks completing property visits on Sturgeon and Savant Lakes. Several papers were prepared for publication on the gold deposits and metallogeny of the Wabigoon Subprovince. Some time was spent with geologists of the Ontario Geological Survey in studies designed to generate mapping and metallogenic projects.

The considerable increase in staking for gold properties increased the need for office consultation and limited field-based studies during the exploration season. However, a project to compile geological and geophysical data in the Pickle Lake area was started in early 1983 with the help of geologists hired under the joint Federal-Province of Ontario Mining Sector Work Program.

Steps were taken to initiate production of a portable field model of X-Ray fluorescence analytical instrument for gold exploration. First results look promising and suggest the method can detect Au in the range of 1 to 2 ppm. This project will be pursued cooperatively with the Ontario Geological Survey in 1984.

Regional input to the West Patricia Land Use Plan was completed in early 1983 and the time demands of this program should drop considerably. Public information

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[1] Resident Geologist, [2] Resource Geologist, Ontario Ministry of Natural Resources, Sioux Lookout.

**Figure 1**
**SIOUX LOOKOUT RESIDENT GEOLOGIST'S AREA**

EXPLANATION

● Producing Mines
  1. Mattabi Mines Ltd. . . . . Zn, Cu, Pb, Ag
  2. Noranda Mines Ltd. (Lyon Lake Division) . . . Zn, Cu, Pb, Ag
  3. Goldlund Mines . . . . . . . . . . . . . . Au

○ Mills
  1. UMEX Incorporated
  2. Corporation Falconbridge Copper

◑ Properties under development
  1. Dome Exploration (Canada) Ltd.
  2. Steep Rock Resources Inc.
  3. Kuhner, Knut

+ Claim Staking, 1983

• Exploration activity, 1983 (keyed to Table 1)

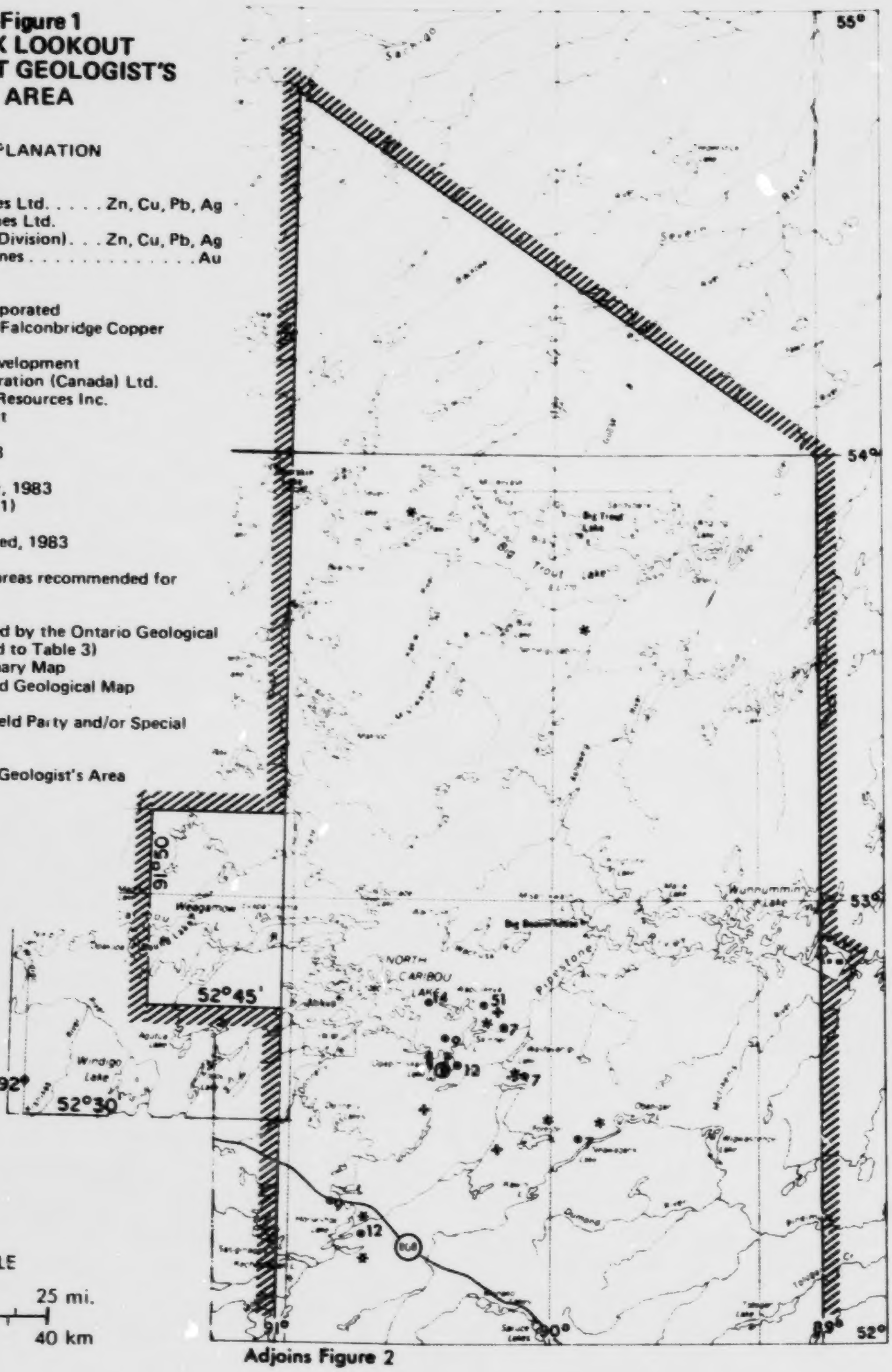
* Assessment work filed, 1983

⧫ Property visits and areas recommended for exploration

—— Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 3)
  P. — Preliminary Map
  2458 — Coloured Geological Map

Ⓐ Location of OGS Field Party and/or Special Project in 1983

▨ Boundary Resident Geologist's Area



55°
Severn
54°
Big Trout Lake
Big Trout Lake
91°50
Weagamow Lake
Wunnummin Lake
53°
Pipestone
NORTH CARIBOU LAKE
52°45'
51
7
12
7
Windigo Lake
92°
52°30
Otoskwin
12
91°
90°
89°
52°
SCALE
0
25 mi.
0
20
40 km

Adjoins Figure 2

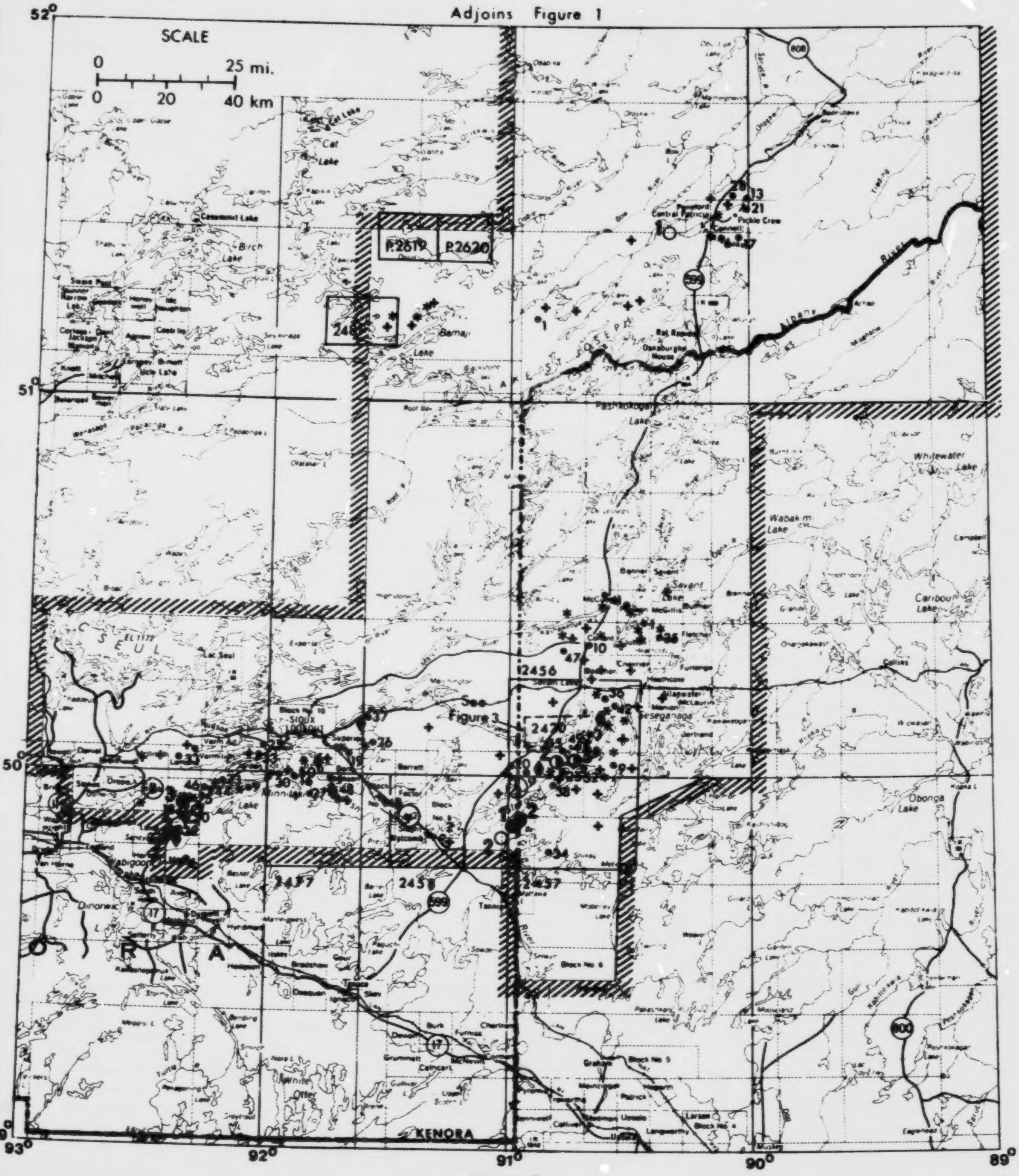

Adjoins Figure 1
SCALE
0
25 mi.
0
20
40 km
52°
51°
50°
49°
93°
92°
91°
90°
89°
Cat Lake
Birch Lake
Bamaji Lake
P.2619
P.2620
24
Lake St. Joseph
Albany River
Osnaburgh House
Pickle Crow
Pashkokogan Lake
Whitewater Lake
Wabakimi Lake
Caribou Lake
Savant Lake
Obonga Lake
Sturgeon Lake
Lac Seul
Sioux Lookout
Minnitaki Lake
See Figure 3
2456
2470
2437
2458
2457
Dinorwic
Wabigoon Lake
ONTARIO
KENORA
599
808
17
800
Block No. 6
Block No. 5
White Otter L.

Figure 2

programs were run in the local schools by D. Janes and R. Huggins. Several lectures and tours were given to 2 Junior Ranger Camps.

Three graduate students conducting research on problems related to metamorphism in the English River Gneissic Belt were aided materially and logistically by this office in 1983. These are programs which the senior author wishes to encourage in the coming year, since they are expected to provide an economical method of gaining regional background information which cannot be obtained otherwise.

During the course of field work and during office visits, the senior author has benefited from discussions with C. Kuryliw, L. Cunningham, R. Bernatchez, Allen Best, J. Langelaar, D. Wahl, and a number of other exploration personnel from the companies working in the area; and thanks them for their help and discussions.

# Mining Activity

Three major mines operated in the Patricia Mining Division in 1983. Two mines containing operational mills are shut down in the Division.

Mattabi Mine and Lyon Lake Mine operated profitably in 1983, producing ore which was milled at the Mattabi mill on Sturgeon Lake. A floatation process produces zinc, copper, and lead/zinc concentrates. The mill is currently processing ore at the rate of 3000 tons per day, with ore drawn equally from each mine. The F-1 pit produced ore during the summer of 1983 but is now virtually exhausted. At year end, approximatey 400 people were employed in the Mattabi and Lyon Lake (Noranda Mines Limited) operations on Sturgeon Lake.

The Thierry Mine (UMEX Incorporated) at Pickle Lake remained shut down in 1983. A re-evaluation of mining methods was completed and a decision was made to maintain the operation in a shut-down condition with a small maintenance staff on site. All of the physical plant, including the town site, will be maintained until higher base-metal prices allow re-opening the operation.

Goldlund Mines Limited, near Sioux Lookout, operated during 1983, producing 7338 ounces of gold in concentrate from 50 412 tons of ore from September 1982 to September 1983 (Northern Miner, December 1, 1983). The mine has had consistent cash flow problems after bringing the property into production without major debt financing. The recently announced agreement with Campbell Resources Incorporated will involve a management contract and financing which will allow Campbell Resources Incorporated to take up to a 40.3% interest in the property if all options are exercised. Goldlund Mines Limited has been operating a combined open pit, decline-accessed underground operation which produced gravity and floatation concentrates. The mill was rated at 200 tons per day but until recently, ran at 170 to 180 tons per day. Installation of regrind and oversize recycling has increased the mill to 200 tons per day. In late summer, Goldlund Mines Limited commenced construction of a 500 ton-per-day mill and completed installation of sampling and control equipment needed for custom milling. Construction of the new mill is proceeding and should be completed by spring. Excess capacity will allow Goldlund Mines Limited to accept custom ore in the new year.

# Industrial Minerals

## Potting Soil and Horticultural Products

Du-Nor Products expanded facilities and production at their Sioux Lookout plant. Local black soil, marl, and crushed rock are converted to commercially branded products for the Western Canada market. In spite of extreme price competition within their main market, Du-Nor Products have maintained a market share in their horticultural line and are currently test-marketing in the United States. Other products, based on local resources, are being investigated for possible trial marketing.

## Sand and Gravel

Approximately 525 000 tons of aggregate were used in the Sioux Lookout Territorial District in 1983. No new sources of coarse aggregate were developed during the year and this is now a continuing concern.

## Rock Ballast

The Canadian National Railways owns a quarry at Watcomb which supplies crushed rock for railway ballast from Thunder Bay to Winnipeg. No new crushing was done in 1983 and stockpiles were drawn down. In 1984, a new program will start to produce 1.3 million cubic yards over the next several years. The rock crushed is a dense massive mafic rock which yields a tough angular aggregate.

# Mineral Exploration Activity

Base-metal exploration was practically nonexistent during 1983. The little activity noted was involved in maintaining existing properties and only one small "grass-roots" program was run on Minnitaki Lake. From the number of inquiries received and from discussions with company personnel, it appears that projects are planned but await a significant increase in base-metal prices for start-up.

The same pattern exists for lithophile mineralization. A number of highly prospective areas and properties are known within the Patricia Mining Division and the Kenora Mining Division but are not under active exploration. The better properties are being maintained and the less de-

TABLE 1

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Amoco Canada Petroleum Limited | Circulation (overburden) drilling in Duffel Lake area. |
| 2 | Armstrong, G. A., et al | Drilling south of Mattabi Mine Site. |
| 3 | Aubet Resources | Drilling at St. Anthony Gold Mine site in Sturgeon Lake Area. |
| 4 | Bernier, K. | Geophysics, sampling, trenching at Sandybeach Lake. |
| 5 | Braeswood Exploration | Geophysical Surveys in Kabik Lake and Pickerl Township. |
| 6 | Canadex Resources | Geophysics in the Dona Lake Area. Stripping, trenching, geology and geophysics in the Sturgeon Lake Area. |
| 7 | Canadian Nickel Company Limited | Magnetic survey in Skinner Lake area; geological report, chip sampling and magnetic survey in Zeemel Lake and Karl Lake Areas; Geological report, diamond drilling report in Neawagank Lake area. |
| 8 | Ciglen, Samuel | Geophysics in Squaw Lake area. |
| 9 | Cominco Limited | Overburden drilling, basil till, geochem. at Akow Lake;electromagnetic and magnetic surveys, Tak property assessment report in Kabik Lake and Pickerel Township; Geology in Fourbay Lake area. |
| 10 | Corporation Falconbridge Copper | Geophysical survey in Conant Township; magnetic survey and proton magnetic survey in Houghton Lake area; magnetic survey in Penassi and Six Mile Lake areas. |
| 11 | Dejour Mines Limited | Geophysics, trenching and sampling in Four Bay Lake Area. |
| 12 | Dome Explorations (Canada) Limited | Diamond Drilling in Dona Lake and Coucheemoskog Lake areas; Helicopter magnetic survey and total field magnetic survey in Horseshoe Lake area; diamond drilling in Wapamisk Creek and Zeemel Lake areas, as well as Opapimiskan Lake area. |
| 13 | Dora Explorations Limited | Geophysics in Tarp Lake area; electromagnetic survey and diamond drilling in McCullagh and Connell Townships. |
| 14 | Eldor Resources Limited | Property Report and diamond drilling in North Caribou and Erichson Lake areas. |
| 15 | Esso Minerals | Geology in the Sturgeon Lake area. Diamond drilling in the Opapimiskan Lake area. |
| 16 | Golden Range Resources Limited | Diamond drilling in the Parnes Lake area. |
| 17 | Golden Shadow Resources | Geological, geochemical and trenching in the Pickle Lake area. |
| 18 | Goldlund Mines Limited | Diamond drilling in area of Echo and McAree Townships; geological report in McAree Township. |
| 19 | Goldwinn Resources Limited | Property report on Alkenore-Buffalo and Split Lake properties. |
| 20 | Gossan Resources | Geophysics, Electromagnetic 16 Survey in Fourbay Lake area. |
| 21 | Hodge, H. J. Inc. | Geophysical survey (magnetic and electromagnetic) in Tarp Lake area (McCullagh Township). |
| 22 | Johnson, Sherridon | Geological report in Beckington Lake area; Proton magnetic and VLF electromagnetic report in Fourbay Lake area; trenching in McAree Township. |
| 23 | Jonpol Exploration | Airborne Geophysics in Sturgeon Lake area. |
| 24 | Keezic Resources | Geophysics, Geological Survey in Sturgeon Lake area. |
| 25 | Kerr Addison Mines Limited | Diamond drilling in Fourbay Lake area; Geochemical survey in Vermilion Lake area. |
| 26 | Kuryliw, C. | Geological report, magnetic and electromagnetic survey in Zarn Lake area; Geological mapping in King Bay area of Sturgeon Lake. |
| 27 | Lloydex Resources | Trenching, VLF EM-16, geochemistry in the King Bay area of Sturgeon Lake. |
| 28 | Marietta Resources Corporation | Magnetic survey in Dona Lake area; diamond drilling, geological mapping, electromagnetic survey in Tarp Lake of the Pickle Lake area |
| 29 | McCrindle, William | Geological report in Squaw Lake and Fourbay Lake area of Sturgeon Lake. |
| 30 | Mid-Canada Explorations | Geological mapping and diamond drilling on Neepawa Island of Minnitaki Lake. |

TABLE 1 Continued

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 31 | Mid-North Engineering Services | Summary of 1982 Field Surveys, magnetic survey and VLF EM in Beckington Lake area. |
| 32 | Moran Resources Corporation | Airborne magnetic and electromagnetic survey in Squaw Lake area of Sturgeon Lake; geological, geophysical surveys in King Bay area of Sturgeon Lake. |
| 33 | Nahanni Resources | Diamond drilling in Kabik Lake and Pickerel Township; geological report on Pickerel Township; diamond drilling in Drayton Township. |
| 34 | Noranda Exploration Company Limited | Diamond drilling west of Claw Lake and south of Swamp Lake in the southern Sturgeon Lake area; diamond drilling, geophysical surveys north of Lyon Lake and Spruce Cone Lake in the southern Sturgeon Lake area; EM and magnetic survey of Glider Lake area. |
| 35 | Northern Canada | Diamond drilling in Savant Lake area (Smye Township). |
| 36 | Northwest Geophysics | Magnetic and EM survey in Squaw Lake and Beckington Lake areas. |
| 37 | Petrunka, Dave | Sampling, geology in Echo and McAree Townships. |
| 38 | Playfair Mines | Geology, geophysics in N.E. Arm of Sturgeon Lake area. |
| 39 | Ram Petroleum Limited | Geological report on One Pine Lake area of Poisson Township. |
| 40 | Ramsay, Raymond G. | Magnetic survey of Puddle Lake area in Conant Township. |
| 41 | Raylloyd Mines and Exploration Limited | Property Report done on Wiggle Creek of Grebe and McCubbin Township; Geophysical maps, gold property report, aerophysical and geological plan and diamond drilling in Grebe and McCubbin Township. |
| 42 | Sherritt Gordon Mines Limited | Magnetic and electromagnetic report on Davidson-Carr property in Beckington Lake area; geological survey of Davidson-Carr property; assay report and geological survey of Squaw Lake area. |
| 43 | Steeprock Resources | Diamond drilling, geological and geochemical survey in Fourbay Lake area of Sturgeon Lake. |
| 44 | Sulpetro Minerals Limited | Geological survey of Pickerel Township. |
| 45 | Tandem Resources | Geophysics and geological survey in Sturgeon Lake area. |
| 46 | Tarbush Lode Mining Company | Diamond drilling in Echo Township; magnetic survey in Pickerel and Echo Townships; geological survey of Miles Lake property in Pickerel Township; diamond drilling in McAree and Laval Townships. |
| 47 | Teck Exploration | Geophysics, geology and sampling in Savant Lake. |
| 48 | Utah Mines | Geophysics, geological surveys in Southeast Bay of Minnitaki Lake. |
| 49 | W. G. Timmins Exploration and Development Limited | Geology, sampling in Sturgeon Lake area. |
| 50 | Wilkinson, D. | Drilling, sampling in Echo Township. |
| 51 | #493217 Ontario Limited | VLF EM and magnetic survey of Opapimiskan Lake in the Neawagank Lake area, the Skinner Lake area and the Zeemel Lake area. |

veloped prospects are being dropped or reduced to the crucial claims. Terrains with good-to-excellent prospects for lithium, tantalum, tungsten, and molybdenum are open and will be available when metal markets allow renewed activity.

The obvious exception to this picture of retrenchment is gold exploration. All areas known to have significant gold mineralization have had staking and exploration to greater or lesser extent. This is reflected in claim staking which rebounded from very low levels in 1982 to the highest levels since the Sturgeon Lake base-metal rush of 1970 to 1972.

The number of active claims has exceeded 10 000 which is a 12-year high and indicates the continuing exploration effort for gold in the Patricia Mining Division.

The most important development this year has been the recent decision of the Musselwhite Consortium to go underground on their Opapimiskan Lake property. This property, 80 air miles north of Pickle Lake, will be connected to the all-weather highway by a winter road along which heavy equipment will be moved to the site. A decline will be driven out under the lake in order to extract a large bulk sample. The results of this bulk sample will be used in a mine feasibility study. Dome Mines Limited will be the operator for the Consortium. The only published ore reserves are 1 million tons at 0.2 ounce gold per ton (Northern Miner, March 5, 1981). The results of 2 later-winter drill programs have not been disclosed.

There has been a considerable increase in gold exploration activity in the North Caribou Lake, Horseshoe Lake, and Pickle Lake volcanic belts.

At Pickle Lake, interest is centred on mine tailings and ore remaining in the Pickle Crow Mine. Additional work is planned for Tarp Lake and the Norpic property.

A small staking rush developed over the Hasaga Mines Property (Koval-Ohman Occurrence) which is located 30 miles southwest of Pickle Lake, north of Matapesatakun Bay of Lake St. Joseph. The prospect has reported tonnage of 150 000 tons at a grade of 0.15 to 0.18 ounce gold per ton. The strike length of the drilled ore zone was reported to be up to 300 feet in length with ore intersections of 15 to 17 feet. Some 300 claims have been tied in on the strike extentions of the original property.

The most active exploration areas in the Patricia Mining Division continue to be the Sturgeon Lake and Savant Lake areas. Minnitaki Lake has been less active, probably due to the lack of open staking ground. An examination of Figure 2 of this report will indicate the concentration of exploration and development activity in the abovementioned areas.

In particular, the northern half of the Sturgeon Lake area has been quite busy with little open ground left in the favourable areas. The geological and metallogenic settings of this area are discussed below.

## Sturgeon Lake Area

Since the late 1890s, gold exploration in the northern part of the Sturgeon Lake area has continued, albeit sporadically. The one past producer, the St. Anthony Mine, was developed in the early 1900s and ceased production in 1941, after not more than 12 years of actual production.

Geologically, the Sturgeon Lake Volcanic Belt is a typical synformal structure with mafic volcanic rocks flanking and underlying felsic volcanic rocks and derived sediments occurring along the area of the synformal axis.

Also, typically, major faulting roughly parallels the synformal axis. The loci of many gold occurrences appear to lie along this faulting and parallel shears, but is also present along an earlier faulting normal to the synformal axis.

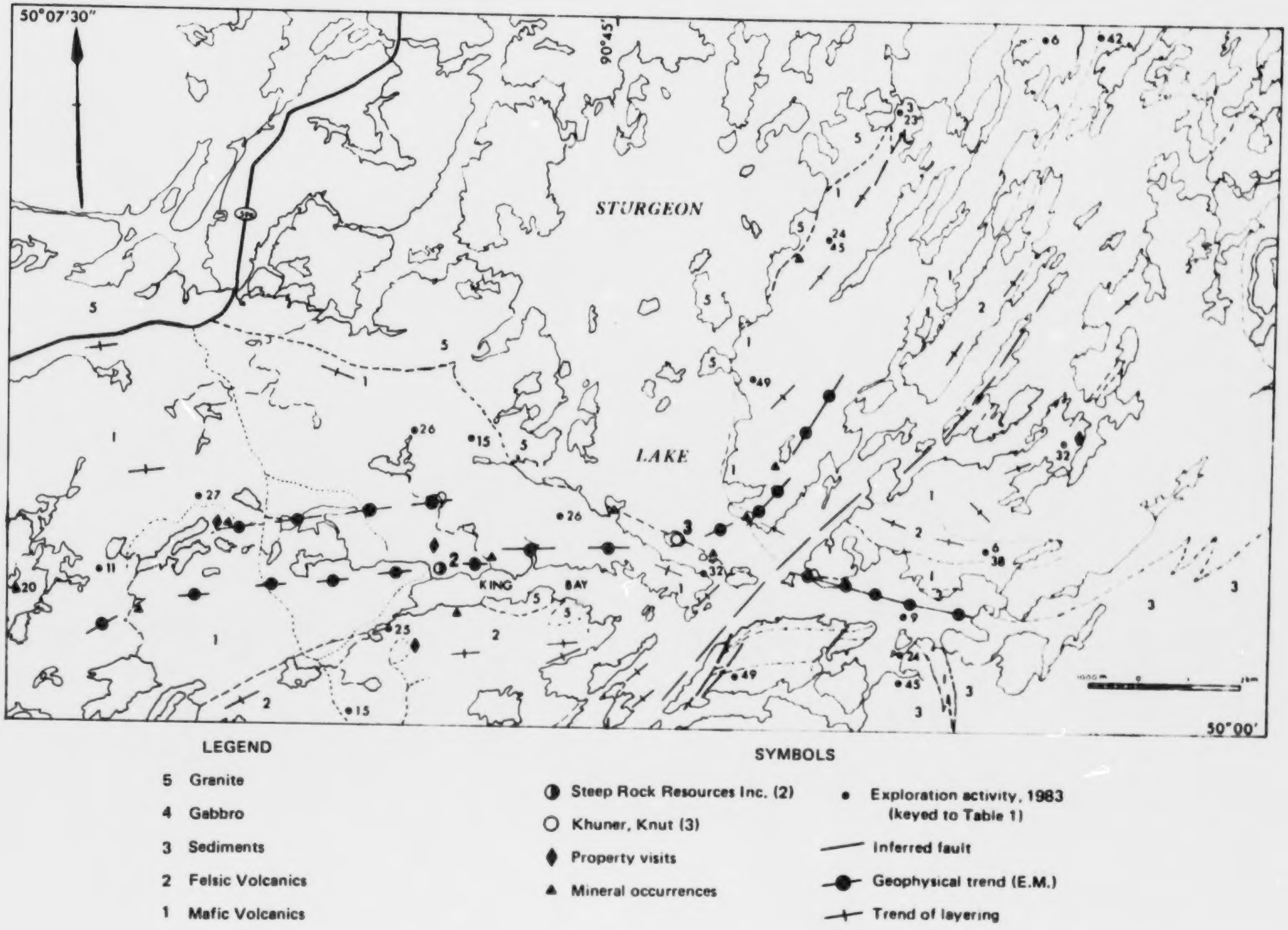
In Figure 3, a generalized representation of the lithologic and structural setting is given. The authors interpret the setting as an early east-west faulting along King Bay and East Bay, with resultant rotation of bedding trends near the fault trace. Pronounced geophysical trends are evident in East Bay, and support this interpretation. The physical evidence for faulting is less convincing in King Bay, but a number of geophysical conductors are present in the inferred location. The later southwest-northeast faulting is quite evident in Northeast Bay of Sturgeon Lake (Trowell 1983a) and the physical evidence is compelling. This fault does not appear to have as much strike-slip component as the earlier fault and displacement may have been essentially dip-slip. The third metallogenically active structural component in the area, at least in terms of gold metallogeny, appears to be the emplacement of granitoid phases of the Lewis Lake Batholith.

The timing of the 3 structural events is by no means certain but it appears that some of the granitoids predate the east-west faulting and have been sheared to produce cataclasites in East Bay. Granite emplacement and faulting may have been synchronous which would explain highly irregular, embayed contacts of pillowed volcanic rocks and late, porphyritic phases of the granitoids on the Rickaby Mines and Rainbow Island properties between King Bay and East Bay. The main southwest-northeast fault appears to overprint and possibly re-activate the earlier faults.

Gold vein emplacement appears to occur post intrusion and post early faulting. Gold deposition may precede the late faulting since few gold veins are found in the mylonites and cataclasites, even though highly anomalous gold contents are reported from these rocks (Trowell 1983b). It would seem likely that hydrothermal gold deposition would have occurred in the reactive cataclasitic rocks if they had been available as sites for mineralization.

Vein-type gold deposition has favoured the following sites all of which predate the late faulting:

1. North-south contacts of the Lewis Lake Batholith and the mafic volcanic rocks (St. Anthony Mine)
2. Narrow, white quartz veins at the contacts of competent intrusive rocks in felsic volcanic rocks (Richelieu Mine)


50°07'30"
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50°00'
STURGEON
LAKE
KING
BAY
LEGEND
5 Granite
4 Gabbro
3 Sediments
2 Felsic Volcanics
1 Mafic Volcanics
SYMBOLS
◑ Steep Rock Resources Inc. (2)
○ Khuner, Knut (3)
♦ Property visits
▲ Mineral occurrences
• Exploration activity, 1983 (keyed to Table 1)
Inferred fault
Geophysical trend (E.M.)
Trend of layering

Figure 3 – Geology of the Sturgeon Lake Area

TABLE 2

SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

* Corrected figures of 1982

** 1983 figures up to and including November

| Year | Claims Recorded | Claims Cancelled | Claims Active | Diamond Drilling (Man Days) | Geophysical Surveys (Man Days) | Geological Surveys (Man Days) | Total Man Days |
|---|---|---|---|---|---|---|---|
| 1974 | 1,011 | 3,223 | 5,659 | 38,049.0 | 6,255 | 102 | 44,406 |
| 1975 | 1,019 | 2,489 | 3,903 | 38,492.7 | 18,953 | 1,858 | 59,303.7 |
| 1976 | 1,185 | 1,120 | 3,958 | 27,111.0 | 11,555 | 185 | 38,851 |
| 1977 | 1,261 | 1,320 | 3,760 | 17,880.1 | 13,931 | 946 | 32,757.1 |
| 1978 | 2,018 | 765 | 5,094 | 33,371.3 | 57,501 | 600 | 91,472.3 |
| 1979 | 1,012 | 1,061 | 5,045 | 30,869 | 27,605.4 | 1,949 | 60,423.4 |
| 1980 | 3,485 | 1,391 | 7,068 | 42,633 | 13,524 | 10,800 | 66,957 |
| 1981 | 2,861 | 1,582 | 8,303 | 42,588 | 232,184 | 4,866 | 287,626 |
| 1982* | 842 | 1,766 | 7,737 | 35,329 | 73,486 | 13,980 | 167,289 |
| 1983** | 4,221 | 1,353 | 10,605 | 68,969.8 | 52,376.5 | 19,018 | 176,175.1 |

TABLE 3 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

221, 224, 227

Open File Reports

5333
5446

Preliminary Maps - Geological Series

2619
2620
2591

Preliminary Maps - Data Series

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

2420, 2457, 2458, 2477, 2481

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

110

Geological Survey of Canada Open File Reports

## SIOUX LOOKOUT — NORTHWESTERN REGION

TABLE 4

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Akow Lake | 53B/16SW | Cominco Limited | BM, Au | Assess. | Overburden Drilling | 1982 | 2.4877 | 2 |
| Beardy Creek (East) | 53H/12NE | Canadian Occidental Petroleum Limited | BM | Assess. | AEM, AMag | 1982 | 2.5009 | 6 |
| | | | BM | Assess. | 3-DDH-533.6' | 1982 | | 7 |
| Beckington Lake | 52J/2NE | Umex Incorporated | BM | Assess. | Mag, VLF EM | 1982 | | 50 |
| | | Umex Incorporated | BM | Assess. | 6-DDH-2767' | 1982 | | 51 |
| | | Umex Incorporated | BM | Assess. | EM | 1982 | | 52 |
| | 52J/2NE | Sherritt Gordon Mines Limited | BM, Au | Assess. | EM, Mag | 1982 | | 53 |
| | 52J/2NE | Umex Incorporated | BM | Assess. | EM, Mag | 1982 | | 54 |
| | 52J/2NE | Mid-North Engineering Services | BM | Assess. | EM, Mag | 1982 | | 55 |
| | 52J/2NE | Sherritt Gordon Mines Limited | BM, Au | Assess. | A, Geol | 1982 | | 56 |
| | 52J/2NE | Northwest Geophysics | BM | Assess. | Mag, EM | 1982 | | 57 |
| | 52J/2NE | Sherritt Gordon Mines Limited | BM, Au | Assess. | Geol | 1981 | | 58 |
| | 52J/2NE | Johnson, Sherridon | BM, Au | Assess. | Geol | 1982 | | 59 |
| Big Trout Lake (NE) | 53H/13NW | Canadian Occidental Petroleum Limited | BM | Assess. | AEM, VLF, Mag | 1982 | 2.5184 | 2 |
| Collishaw Lake | 52P/12NW | Umex Incorporated | BM | Assess. | EM, Mag | 1982 | 2.4899 | 21 |
| Conant Township | 52J/7SE | Falconbridge Copper | BM | Assess. | HLEM | 1981 | | 93 |
| | | Ramsey, Raymond G. | Au | Assess. | Mag | 1982 | | 94 |
| Dona Lake | 520/8NE | Marietta Resources Corporation | Au | Assess. | Mag | 1982 | 2.4220 | 37 |
| | 520/8NE | Dome Exploration (Canada) Limited | Au | Assess. | 9-DDH-4,422' | 1983 | | 56 |
| Drayton Township | 52J/4SW | Denison Mines Limited | BM, Au | Assess. | Mag, Geochem | 1981 | 2.4111 | 23 |
| Drum Lake | 520/3NE | Cominco | BM, Au | Assess. | Geol | 1982 | 2.4642 | 42 |
| Duffel Lake | 520/2NW | Amoco Canada Petroleum Limited | BM | Assess. | Overburden Drilling | 1983 | | 6 |
| Echo Township | 52F/16NW | Goldlund Mines Limited | Au | Assess. | 4-DDH-539.8' | 1983 | | 64 |
| | | Goldlund Mines Ltd. | Au | Assess. | Tr, Geol | 1983 | | 65 |
| | 52F/16NW | Tarbush Lode Mining Company | Au | Assess. | 2-DDH-998' | 1983 | | 66 |
| Fourbay Lake | 52J/2SW | Johnson, Sherridon | BM, Au | Assess. | Mag | 1982 | 2.5395 | 63 |
| | 52J/2SW | Kerr Addison Mines | Au | Assess. | 5-DDH-2302.9' | 1982 | | 64 |
| Glider Lake | 52K/7SW | Noranda Mines Limited | BM | Assess. | Mag, EM | 1982 | 2.4817 | 2 |
| Grebe Lake and McCubbin Township | 52J/7NE | Raylloyd Mines and Exploration Limited | Au | Assess. | Geophy, Geol | 1983 | 2.5565 | 47 |
| | 52J/7NE | Raylloyd Mines and Exploration Limited | Au | Assess. | AMag, Mag, Geol, Geochem, VLF EM | 1983 | 2.5071 | 48 |
| | 52J/7NE | Raylloyd Mines and Exploration Limited | Au | Assess. | 2-DDH-681' | 1983 | | 49 |

**TABLE 4 Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Houghton Lake | 52J/7SW | Corporation Falconbridge Copper | BM | Assess. | Mag | 1982 | 2.5137 | 25 |
| Jutten Township | 52J/8NW | Abitibi-Price Inc. | BM, Au | Assess. | EM, Special Provision | 1982 | 2.4792 | 36 |
| Kabik Lake and Pickerel Township | 52F/16NE | Tarbush Lode Mining Limited | Au | Assess. | Geol | 1982 | | 53 |
| | 52F/16NE | Cominco Limited | Au | Assess. | 2-DDH-337' | 1983 | | 54 |
| | | Cominco Limited | Au | Assess. | VLF EM, Mag | 1982 | | 55 |
| | 52F/16NE | Nahanni Mines Limited | Au | Assess. | 6-DDH-3812.5'<br>Assays | 1982 | | 56 |
| | | Nahanni Mines Ltd. | Au | Assess. | Geol | 1982 | | 57 |
| | 52F/16NE | Kidd, Ross | Au | Assess. | Geophys | 1982 | | 58 |
| Karl Lake | 53B/9SE | Canadian Nickel Company Limited | BM | Assess. | Geol | 1982 | 2.5417 | 2 |
| Kecheokagan Lake | 53B/2NW | Dome Exploration (Canada) Limited | BM, Au | Assess. | Mag | 1981 | 2.4871 | 8 |
| Laval Township | 52F/16SW | Tarbush Lode Mining Limited | Au | Assess. | Line Cutting, Mag, Tr | 1981 | | 35 |
| McAree Township | 52F/16SW | Tarbush Lode Mining Limited | Au | Assess | 2-DDH-908' | 1981 | | 34 |
| | 52F/16NW | Goldlund Mines Limited | Au | Assess. | 4-DDH-539.8' | 1983 | | 64 |
| | 52F/16SW | Goldlund Mines Limited | Au | Assess. | Geol | 1983 | | 37 |
| Neawagank Lake | 53A/5NW | #493217 Ontario Limited | Au | Assess. | Mag, EM, Line Cutting | 1982 | | 7 |
| | 53A/5NW | Canadian Nickel Company Limited | BM | Assess. | Geol, A,<br>18-DDH-2488.2m | 1982 | | 8 |
| | 53A/5NW | Canadian Nickel Company Limited | BM | Assess. | 1-DDH-100.3m | 1982 | | 9 |
| | | | BM | Assess. | 5-DDH-2258.3' | 1983 | | 10 |
| North Caribou Lake (NE Part) | 53B/15SE | Canadian Occidental Petroleum Limited | BM | Assess. | Mag, EM | 1982 | 2.4847 | 3 |
| | 53B/15NE | Eldor Resources Limited | BM | Assess. | 4-DDH-1641' | 1983 | | 4 |
| Parnes Lake | 52G/13NW | Golden Range Resources Limited | BM, Au | Assess. | 5-DDH-580' | 1983 | | 31 |
| Penassi Lake | 52G/14NE | Corporation Falconbridge Copper | BM | Assess. | Mag | 1982 | 2.4749 | 68 |
| Pickerel Lake | 52F/16NE | Tarbush Lode Mining Limited | Au | Assess. | Mag, Special Provision | 1982 | 2.4648 | 52 |
| Poisson Lake | 52J/8NW | Abitibi-Price Inc. | Au | Assess. | Tr, A | 1982 | 2.5039 | 34 |
| | 52J/8NW | Ram Petroleum Limited | Au | Assess. | Geol | 1982 | 2.5229 | 35 |
| Sixmile Lake | 52G/15NE | Corporation Falconbridge Copper | BM | Assess. | Mag | 1982 | 2.4749 | 68 |
| Skinner Lake | 53B/9NW | #493217 Ontario Limited | Au | Assess. | Mag, EM | 1982 | 2.4568 | 9 |
| | 53B/9NW | Canadian Nickel Company Limited | BM | Assess. | Mag | 1982 | 2.4909 | 10 |
| Smye Township | 52J/8NW | Northern Canada | BM | Assess. | 22-DDH-1404.8' | 1959 | | 33 |
| Squaw Lake | 52J/2SE | Sherritt Gordon Mines Limited | BM, Au | Assess. | A | 1982 | 2.5148 | 49 |
| | 52J/2SE | Umex Incorporated | BM | Assess. | Mag, EM | 1982 | 2.4802 | 50 |
| | 52J/2SE | McCrindle, William | BM | Assess. | Geol | 1983 | | 51 |
| | 52J/2SE | Umex Incorporated | BM | Assess. | EM | 1982 | 2.4752 | 52 |
| | 52J/2SE | Ciglen, Samuel | BM, Au | Assess. | Mag, EM | 1983 | 2.5489<br>2.5490 | 53 |
| | 52J/2SE | Moran Resources Corporation | Au | Assess. | AEM, Mag | 1983 | 2.4902 | 54 |

**TABLE 4 Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Tarp Lake | 52O/9SE | Gallant Gold Mines Limited | Au | Assess. | Mag, EM | 1982 | 2.4697 | 40 |
| | 52O/9SE | Dora Explorations | Au | Assess. | Mag, EM | 1982 | 2.4744 | 41 |
| | 52O/9SE | Dora Explorations | Au | Assess. | EM,<br>18-DDH-5,741' | 1981 | 2.4725 | 42 |
| | 52O/9SE | Marietta Resources Corporation | Au | Assess. | 18-DDH-5,741' | 1981 | | 43 |
| Wapamisk Creek | 53B/2NE | Canadian Occidental Petroleum Limited | BM | Assess. | Mag, EM | 1982 | 2.4956 | 3 |
| | 53B/2NE | Dome Exploration (Canada) Limited | Au | Assess. | 5-DDH-3617' | 1983 | | 4 |
| | 53B/2NE | Canadian Occidental Petroleum Limited | BM | Assess. | Geochem, Geol | 1982 | | 5 |
| | 53B/2NE | Norcen Energy Resources Limited | Au | Assess. | Mag, EM | 1982 | | 6 |
| Webb Township | 52F/15NE | Patino Mines (Quebec) Limited | Tc | Assess. | Mag, EM | 1981 | | 26 |
| Wesleyan Lake | 52O/4NE | Sulpetro Minerals Limited | BM, Au | Assess. | Tr, Geol | 1983 | | 14 |
| Zarn Lake | 52J/4SE | Goldwinn Resources | BM, Au | Assess. | Mag, EM, Geol<br>Stripping,<br>Geochem | 1980 | 2.3786 | 12 |
| | 52J/4SE | Kuryliw, Chester | BM, Au | Assess. | Geol, Mag,EM | 1982 | 2.5361 | 13 |
| | 52J/4SE | Kuryliw, Chester | BM, Au | Assess. | Geol, Mag,EM | 1982 | | 14 |
| Zeemel Lake | 53B/9SW | Canadian Nickel Company Limited | BM | Assess. | Mag | 1982 | 2.4694 | 19 |
| | 53B/9SW | #493217 Ontario Limited | BM, Au | Assess. | EM,VLF,Mag | 1982 | 2.4564 | 20 |
| | 53B/9SW | Dome Exploration (Canada) Limited | BM, Au | Assess. | 54-DDH-29168' | 1982 | | 21 |
| | 53B/9SW | Dome Exploration (Canada) Limited | BM, Au | Assess. | 29-DDH-9219' | 1983 | | 22 |

3. Narrow blue quartz, carbonate lenses at east-west contacts of granitoids and mafic volcanic rocks (Rickaby Mines, Rainbow Island)
4. East-west shears in mafic volcanic rocks hosting blue quartz-pyrite veins (north occurrence, Armstrong-Best Property, Steep Rock Resources Incorporated)
5. Narrow blue quartz lenses in east-west shears within altered mafic volcanic rocks (Lloydex Property, King Bay)
6. Sulphidic shears in altered felsic-ignimbrites and debris flows (Canadex Property, Six Mile Lake).

In many of these mineralizations, vein size and density have been controlled by local deflection or intersection of minor structures by the major deformational trends.

For this reason, the intersection of the Sturgeon Lake Fault with the King Bay-East Bay shear zone appears to be a highly favourable area for exploration. Unfortunately, most of this area is under water. However, VLF surveys have delimited several of the known deposits on land, and may prove valuable in outlining the shear zones which host these vein deposits.

## Recommendations for Exploration

It is difficult to recommend programs for areas that are under active gold exploration as the companies and individuals on site are in the best position to judge the types of programs to follow. In general, all highly favourable areas south of North Caribou Lake have active programs. Virtually all programs are based on previously known gold occurrences. Because of economic considerations, "grass-roots" explorations must presently be based in the southern areas of the Patricia Mining Division where roads and other infrastructure exist. For this reason, new exploratory programs should focus on areas where occurrences and prospects are known, but also examine widely the gold content of a number of less obvious targets. The lesson to be learned from Hemlo and Cameron Lake is that gold may exist outside the obvious, traditional targets. Sampling programs should emphasize testing of zones of silicification in mafic and felsic volcanic rocks close to known gold mineralization. Other lithologic targets which have been relatively neglected in the Wabigoon Subprovince are iron formation and fractured felsic intrusive rocks. Several interesting gold occurrences are located in these types of rocks in the Minnitaki Lake area and warrant investigation. The value of intense prospecting, detailed sampling for gold assays, and trenching and stripping programs cannot be over-emphasized.

One of the interesting areas is the strike extention of the Goldlund Mine. Widely separated scheelite mineralization is noted in this area to the north of the Wabigoon-Miniss Fault and the association of gold and tungsten is well known.

Base-metal porgrams are very difficult to justify in the present economic situation. However, the Savant Lake felsic centre is an extremely favourable area for "Sturgeon Lake" type zinc-copper-silver mineralization and should be followed up when market conditions permit.

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*G.C. PATTERSON, J.K. MASON, AND B.R. SCHNIEDERS*

# Report of Activities 1983 Thunder Bay Resident Geologist Area, North Central Region

**G.C. Patterson[1], J.K. Mason[2], and B.R. Schnieders[2]**

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## Introduction

Current permanent staff in the Thunder Bay Office included K.G. Fenwick, Regional Mineral Resources Co-ordinator, G.C. Patterson, Resident Geologist, J.F. Scott, Resource Geologist, and A.R. Dowton, Secretary. Contract staff comprised the following: L. Battiston and P. Perry, clerical assistance; F.J. Kristjansson, Geologist responsible for the geological input to land use concerns (such as forest management agreements and municipal planning); aggregate mapping, and completing a clay study. The Beardmore-Geraldton Economic Geologist Program was supervised by J.K. Mason, Resource Geologist, with assistance from C.D. McConnell and G.D. White, Resource Geologists; B.R. Schnieders, Resource Geologist, with assistance from R. Dutka and A.A. Speed, Resource Geologists, started an Economic Geologist Program in the Nipigon-Marathon area. M. Kennedy, Resource Geologist, prepared data series compilation maps, geological data inventory folios for the Fort Hope and Schreiber areas and supervised the Mining Sector Work Program. G.H. Brown, Resource Geologist, was contracted at different times to work on gold compilations. F. Baker, M. Fedoroniak, D. Morin, A. MacTavish, B. Maine, B. Kite, V. Kosny, and J. Hendel worked on the Mining Sector Work Program. R. Larsen was contracted to give lectures to the Junior Forest Rangers. R. Shore, an Experience '83 student, assisted with aggregate mapping, and M. O'Brien, an Experience '83 student, assisted with field trips to Hemlo.

## Acknowledgments

The section in this report on Till Sampling and Quaternary Geology was written by F.J. Kristjansson. J.F. Scott wrote the section on Uranium Exploration, and on Gold Exploration in the Thunder Bay to Atikokan area. The description of the Schreiber-Terrace Bay Economic Geologist Program was written by B.R. Schnieders with assistance from A.A. Speed. J.K. Mason, with help from G.D. White, wrote the section on the Beardmore-Geraldton Economic Geologist Program.

## Resident Geologist Staff Activities

Much of the Resident Geologist staff's time was spent in consultation with prospectors and with geologists from exploration and mining companies (an average of 11 consultations a day). Technical advice was given to the Hemlo Co-ordinating Committee and related groups concerned with the Hemlo developments. A series of talks on various aspects of the Hemlo deposit were given to the Canadian Institute of Mining and Metallurgy, Sudbury; Canadian Institute of Mining and Metallurgy, Thunder Bay; Ontario Geological Survey Geoscience Research Seminar, Toronto; Gold Seminar, Thunder Bay; Lakehead University; and the Quebec Prospectors' and Developers' Association, Val D'Or, Quebec. A similar series of talks were given to numerous Ontario government groups: Ministry of Environment, Ministry of Natural Resources, Mining Lands, Lakehead Conservation Authority, Resident Geologists, and the Hemlo Co-ordinating Committee.

A seminar on mining exploration was presented to the Parks Branch, Ontario Ministry of Natural Resources, to assist in setting up guidelines for exploration in candidate parks. A seminar on mining in forest management agreements was given to a forestry group at Lakehead University. A seminar talk was given to the Pic 50 Indian Reserve on employment in mining. A seminar on conflicts between mining and forestry was given to the Great Lakes Forestry Management. A talk on the role of the Ontario Ministry of Natural Resources in geology was given to the Lakehead University Geology Club. A talk and field trip in the Thunder Bay area was given to 60 people from the Earth Science Teachers' Association, Michigan. A total of 17 field trips for government and industry were led in the Hemlo area with approximately 280 participants. M. O'Brien, Experience '83 student, spent 3 weeks supervising Junior Rangers in the cleaning of outcrops in the Hemlo area.

A total of 21 properties were examined and approximately 6 weeks were spent in the field carrying out research in the Hemlo area (Patterson 1983b). Two papers on the Thierry Mine, Pickle Lake, were submitted and accepted by the Canadian Mineralogist. A paper on exploration history at Hemlo was published (Patterson 1983a). A field course on structural geology offered through the Ontario Geological Survey was attended. A field trip arranged through the Resident Geologists' Offices in Timmins, Kirkland Lake, and Cobalt was attended by office staff.

Tours were conducted for mining companies and government personnel. Mason gave 8 tours in the Beardmore-Geraldton area; Schnieders led 10 tours in the Nipigon-Marathon area; Scott took 5 groups to Gunflint fossil locations and 3 groups to the Shebandowan area. Poster displays were given at the Ontario Geological Survey Geoscience Research Seminar, Toronto, on the Beardmore-Geraldton and Schreiber-Terrace Bay areas. The office staff exhibited 8 poster displays for the Gold Seminar in Thunder Bay. Schnieders gave a prospector information session in Terrace Bay. Talks were given at 10 Junior Ranger camps. Both Schnieders (Stott and Schnieders 1983) and Mason (Mason and McConnell 1983) made contributions to the publication "The Geology of Gold in Ontario". Mason also assisted in writing a report for the Summary of Field Work, 1983.

Fenwick carried out field examinations of hazard land locations throughout the Region, as well as historical research on mining in the area.

The office staff (particularly Kristjansson) continued to be involved in land-use planning, mining exploration in candidate parks, forest management agreements, environmental issues, and road and proposed transmission line placements. A number of townships were given assistance in assessing aggregate potential. Several Ontario Municipal Board hearings were attended.

Two Mining Sector Work Program projects, sponsored by the Lakehead Region Conservation Authority, were organized and supervised through this office. Four people worked on geological displays for Sibley, McLeod, Kakabeka Falls, and Neys Provincial Parks. Four people worked on literature research of Hazard Lands in the North Central Region.

# Mining Activities

## Metallic Minerals

The 2 major metal producers in the North Central Region are the Noranda Mines Limited (GECO Division) copper-zinc-silver mine at Manitouwadge (4), and the Inco Metals Limited nickel-copper mine at Shebandowan (3). The former was in continuous production during 1983, milling an average of 3850 tons per day (G. Multimaki, Geologist, Noranda Mines Limited GECO Division, personal communication, 1983). The Shebandowan Mine has been in production from late 1983.

The Pancontinental Mining (Canada) Limited custom mill in Beardmore (7) processed a 1000-ton sample from the Leitch Mine (Teck Corporation, past producer) this year. Northern Concentrators' custom mill in Thunder Bay received 400 tons of ore from the No. 2 zone on the Crooked Green Creek property (5) in Pifher Township, as well as a number of small custom orders from Ontario and Quebec. Consolidated Louanna Gold Mines Limited (1) at O'Sullivan Lake signed a contract with Mining Corporation Limited and is processing 190 to 200 tons per day (George Cross Newsletter Limited, Number 172, 1983, p.3). A headframe has been constructed on the Magnet Consolidated property by Roxmark Mines Limited and Sherritt-Gordon Mines Limited.

Three mines are under development in the Hemlo area. Noranda Mines Limited is currently sinking a shaft; Teck Corporation plans to collar a shaft in December 1983, and Lac Minerals Limited is at the feasibility study stage. Corporation Falconbridge Copper has commenced a feasibility study on its Winston Lake zinc-copper-silver property, northwest of Schreiber.

Q.C. Explorations Limited has set up a Porta-Mill in Thunder Bay to process dredged dump material from the former Silver Islet Mine. Currently, 10 000 tons of muck are stockpiled in Thunder Bay (T. Gledhill, President, Q.C. Explorations Limited, Vancouver, personal communication, 1982).

## Industrial Minerals

Most of the amethyst production came from operations in McTavish Township, northeast of Thunder Bay; these include the deposits of Gunnard Noyes (2), the Ontario Gem Company (6), and Thunder Bay Amethyst Mining Panorama (8). The Thunder Bay Amethyst Mining Panorama has developed a grading system for amethyst based on colour and quality, and has expanded its processing and polishing operation to produce more finished products.

During 1983, Tri-Ven Minerals Corporation stockpiled 10 000 tons of marl on its Shillabeer Lake property, 80 km northeast of Thunder Bay. The company has also developed a spreader for the use of the marl in agriculture. The marl is finer than 60 mesh and 98% $CaCO_3$ (W. Peterson,

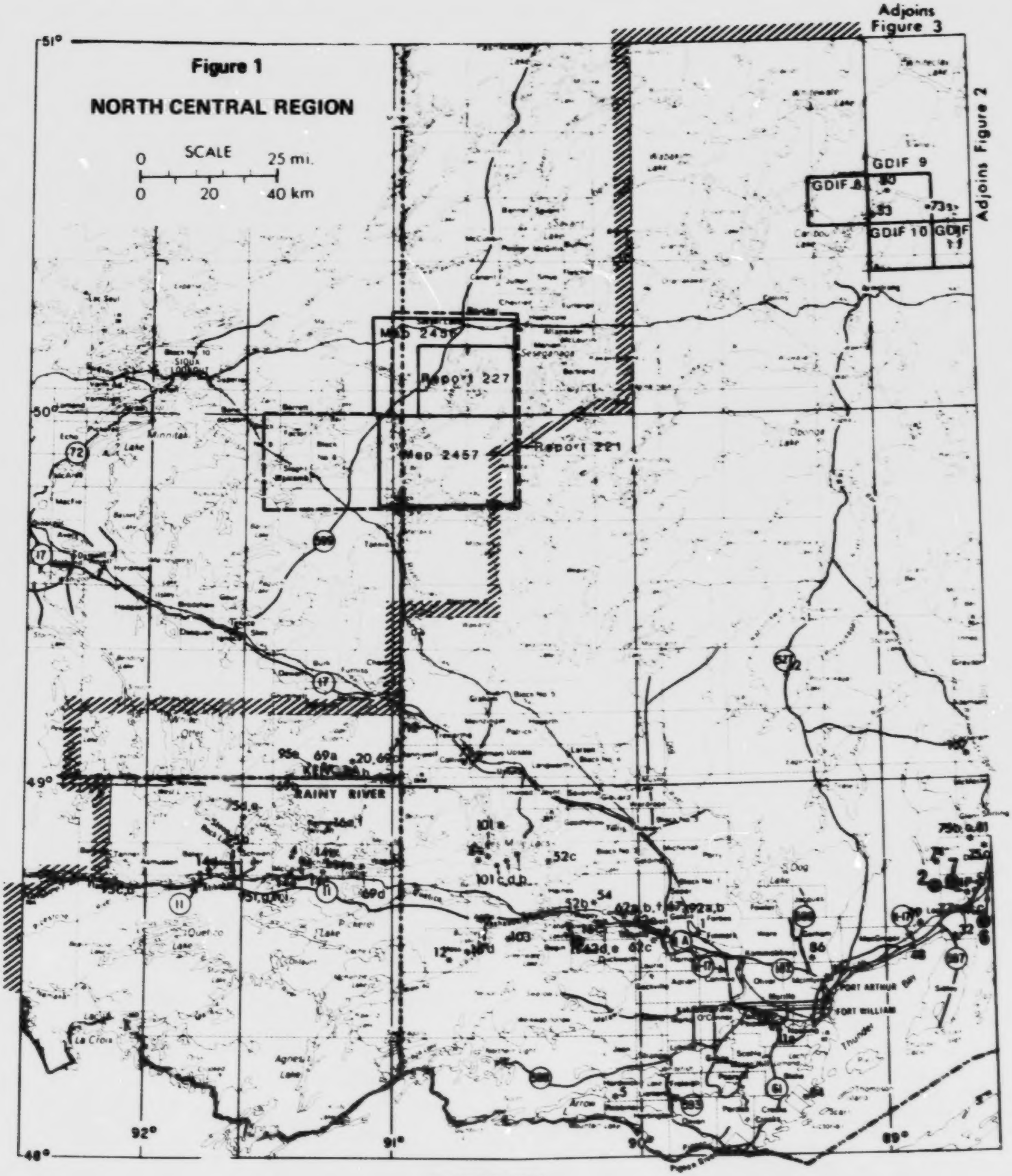

Adjoins Figure 3
Adjoins Figure 2
SCALE
0
25 mi.
0
20
40 km
GDIF 8
GDIF 9
GDIF 10
GDIF 11
Map 2456
Report 227
Map 2457
Report 221
Sioux Lookout
Sesseganaga
RAINY RIVER
PORT ARTHUR
FORT WILLIAM
Thunder
Dog Lake
Quetico Lake
Agnes Lake
La Croix
51°
50°
49°
48°
92°
91°
90°
89°

**Figure 1**

**NORTH CENTRAL REGION**

## EXPLANATION

▬ ▬ ▬ Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 8. Reports listed in Table 8 but not appearing on the map covered an area too large to be accommodated).

GDIF – Geological Data Inventory Folio

2457 – Coloured Geological Map

▨ Boundary of North Central Region

* Assessment Work Filed, 1983 (keyed to Table 1a)

● Exploration Activity, 1983 (keyed to Table 2)

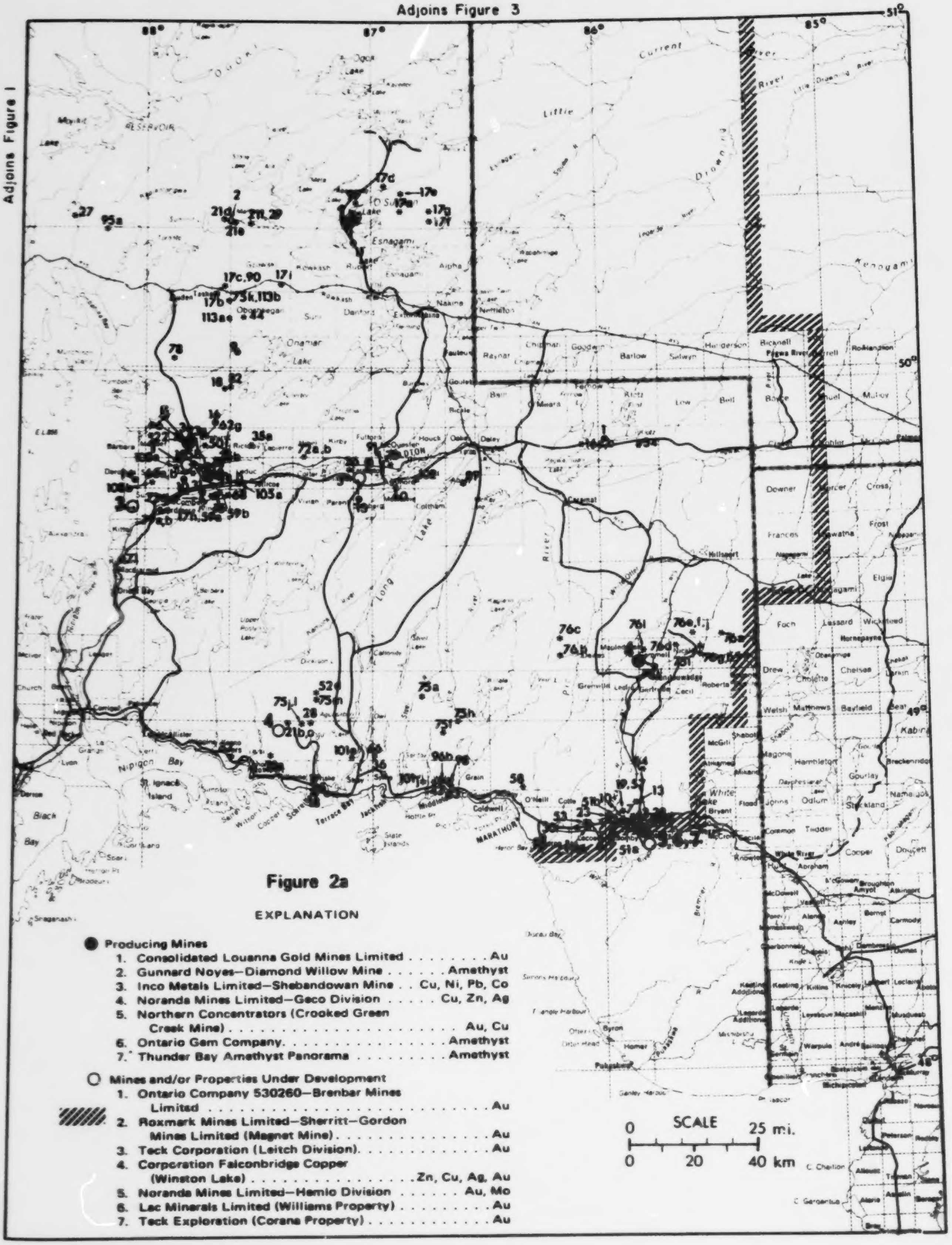

Adjoins Figure 3
Adjoins Figure 1
88°
87°
86°
85°
51°
50°
49°
48°
Ogoki Reservoir
Esnagami
Long Lake
Nipigon Bay
Terrace Bay
Schreiber
Marathon
White River
Manitouwadge
Caramat
Hornepayne
Kenogami
Little Current River
Black Bay
St. Ignace Island
SCALE
0
25 mi.
0
20
40 km

Figure 2a

EXPLANATION

● Producing Mines

| | |
|---|---|
| 1. Consolidated Louanna Gold Mines Limited | Au |
| 2. Gunnard Noyes—Diamond Willow Mine | Amethyst |
| 3. Inco Metals Limited—Shebandowan Mine | Cu, Ni, Pb, Co |
| 4. Noranda Mines Limited—Geco Division | Cu, Zn, Ag |
| 5. Northern Concentrators (Crooked Green Creek Mine) | Au, Cu |
| 6. Ontario Gem Company | Amethyst |
| 7.˚ Thunder Bay Amethyst Panorama | Amethyst |

○ Mines and/or Properties Under Development

| | |
|---|---|
| 1. Ontario Company 530260—Brenbar Mines Limited | Au |
| ▨ 2. Roxmark Mines Limited—Sherritt—Gordon Mines Limited (Magnet Mine) | Au |
| 3. Teck Corporation (Leitch Division) | Au |
| 4. Corporation Falconbridge Copper (Winston Lake) | Zn, Cu, Ag, Au |
| 5. Noranda Mines Limited—Hemlo Division | Au, Mo |
| 6. Lac Minerals Limited (Williams Property) | Au |
| 7. Teck Exploration (Corona Property) | Au |

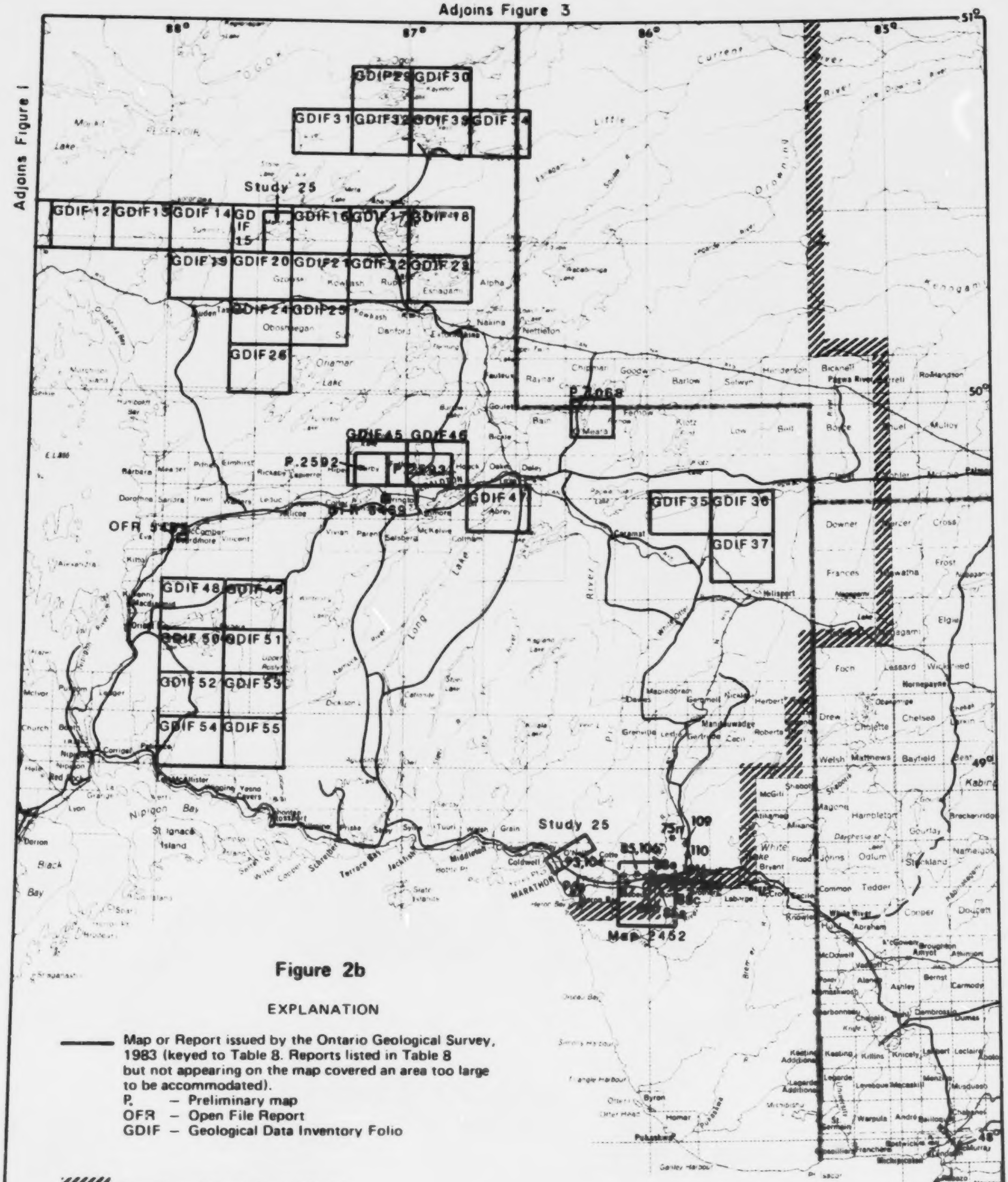

Adjoins Figure 3
Adjoins Figure 1
88°
87°
86°
85°
51°
50°
49°
48°
GDIF 29
GDIF 30
GDIF 31
GDIF 32
GDIF 33
GDIF 34
Study 25
GDIF 12
GDIF 13
GDIF 14
GD IF 15
GDIF 16
GDIF 17
GDIF 18
GDIF 19
GDIF 20
GDIF 21
GDIF 22
GDIF 23
GDIF 24
GDIF 25
GDIF 26
P.2068
GDIF 45
GDIF 46
P.2592
P.2593
GDIF 47
OFR 5
GDIF 35
GDIF 36
GDIF 37
GDIF 48
GDIF 49
GDIF 50
GDIF 51
GDIF 52
GDIF 53
GDIF 54
GDIF 55
Nipigon Bay
Long Lake
Study 25
109
110
75
85,106
73,104
MARATHON
Map 2452
SCALE
0
25 mi.
0
20
40 km

Figure 2b

EXPLANATION

— Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 8. Reports listed in Table 8 but not appearing on the map covered an area too large to be accommodated).

P. – Preliminary map
OFR – Open File Report
GDIF – Geological Data Inventory Folio

▨ Boundary of North Central Region

* Assessment Work Filed, 1983 (keyed to Table 1a)

● Exploration Activity, 1983 (keyed to Table 2)

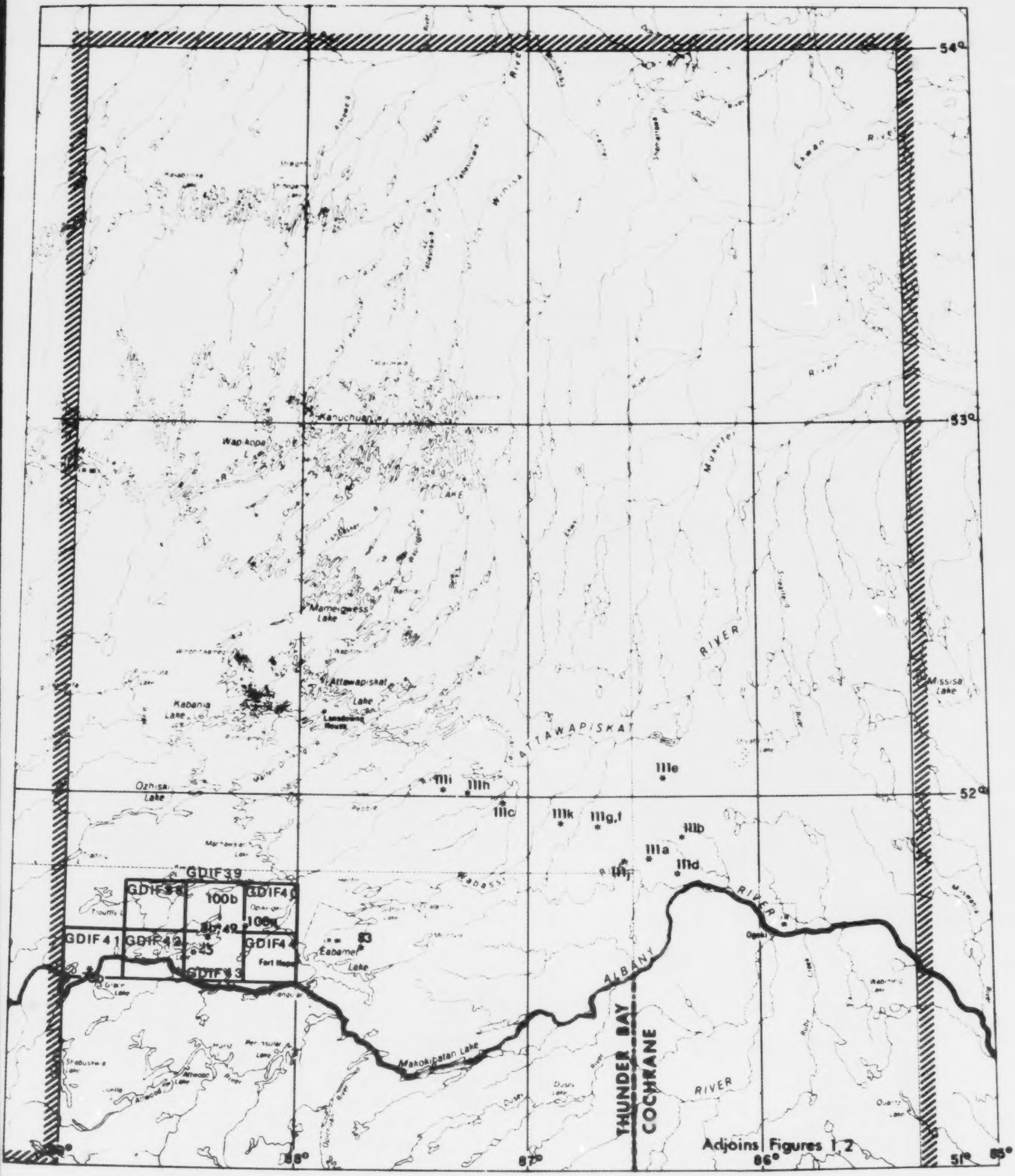

54°
53°
52°
51°
85°
86°
87°
88°
Ekwan River
Winisk
Winisk Lake
Kanuchuan L.
Wapikopa L.
Muskrat
Mameigwess Lake
Attawapiskat Lake
Kabania Lake
Lansdowne House
ATTAWAPISKAT
RIVER
Missisa Lake
Ozhiski Lake
Pebble
Wabassi
111a
111b
111c
111d
111e
111g,f
111h
111i
111j
111k
GDIF39
GDIF38
GDIF40
GDIF41
GDIF42
GDIF43
GDIF44
100b
100c
49
45
83
Eabamet Lake
Fort Hope
Ogoki
ALBANY
RIVER
Makokibatan Lake
RIVER
THUNDER BAY
COCHRANE
Adjoins Figures 1,2

Figure 3

NORTH CENTRAL REGION

SCALE
0
25 mi.
0
20
40 km

**TABLE 1a** **ASSESSMENT WORK AND OTHER INFORMATION RECEIVED**

AEM-Airborne Electromagnetic Survey
A Mag-Airborne Magnetic Survey
A Rad-Airborne Radiometric Survey
AVLF-Airborne Very Low Frequency (EM-16) Survey
Assess-Assessment Work
Non Assess-Non Assessment Work
BS-Beneficiation Studies
DD-Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled, respectively)
EM-Ground Electromagnetic Survey
Geochem-Geochemical Survey
Geophys-Geophysical Survey (e.g.-Max-Min)
GL-Geological Survey
Gr-Gravity Survey

IP-Induced Polarization Survey
Mag-Ground Magnetic Survey
Man-Manual Work
Mech-Mechanical Work
OVD-Overburden Drilling (where shown, the numbers following "OVD" indicate the number of holes drilled and the total length drilled, respectively)
Prog-Progress Report
Rad-Radiometric Survey
Res-Resistivity Survey
SA-Sampling, Assays
Str-Stripping
Tr-Trenching
VLF-Very Low Frequency (EM-16) Survey

Ag-Silver
Amy-Amethyst
As-Arsenic
Au-Gold
Ba-Barium
Be-Beryllium
Bm-Base metals (Cu,Ni,Zn)
Bst-Building Stone
Co-Cobalt
Cs-Cesium
Cu-Copper
Fe-Iron
Feld-Feldspar
Li-Lithium

Mo-Molybdenum
Ni-Nickel
Pb-Lead
Sb-Antimony
Ta-Tantalum
Th-Thorium
W-Tungsten
Zn-Zinc

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Goldie Twp. (G658), Dawson Road Lots (G649) | 52A12/NW/SW/SE | 1. Abitibi-Price Inc. | Au, Bm | Assess | OVD 45-39.8 m | 1983 | 2.5414 | |
| Molson Lake Area (G603) | 42C12/NW | 2. Americ Mines Ltd. | Au, Bm | Assess | Man , Str | 1983 | - | - |
| Tyrol Lake Area (G141) | 42E13/SW | 3a. Anyox Metals Ltd. | Bm | Assess | FN | 1982 | 2.5234 | - |
| Tyrol Lake Area (G141) | 42E13/SW | 3b. Anyox Metals Ltd. | Cu, Au, Ag | Assess | DC 4-466.95 m | 1983 | - | - |
| Sabawi Lake and McCaul Twp. (G554) | 52B14/SW | 4. Asamera Inc. | Au, Bm | Assess | DD 2-184.4 m | 1983 | - | - |
| Wabindon Lake Area (G774) | 52B1/NE | 5. Asarco Explor. Co. of Canada Ltd. | Ag, As, Zn, Mo, Cu, Pb | Assess | GL , Geochem , SA | 1981 | 2.4637 | - |
| Rous Lake Area (G611) | 42D9/NE | 6. Autocrat Resources Ltd. | Au | Assess | Mag , VLF | 1983 | 2.5550 | - |
| Molson Lake Area (G603) | 42C12/NW | 7. Battle Energy Corp. | Au | Assess | Mag , VLF | 1983 | 2.5566 | - |
| Boot Bay Area (M2448) | 52B15/SE | 8a. Bazinet, E.W. | Cu | Assess | DD 1-31.24 m | 1983 | - | - |
| Frond Lake Area (G252) | 52P9/SW | 8b. Bazinet, E.W. | Au, Bm | Assess | DD 1-43.92 m | 1983 | - | - |
| O'Sullivan Lake Area (G362) | 42L6/NE | 8c. Bazinet, E.W. | Au, Ag | Assess | DD 3-142.49 m | 1983 | - | - |
| Molson Lake Area (G603), Rous Lake Area (G611) | 42C12/NW, 42D9/NE | 9. Bel-Air Resources Ltd. | Au | Assess | VLF , Mag , GL , SA, DD8-1019.28 m | 1982 | 2.4830 and 2.5188 | - |
| Molson Lake Area (G603) | 42C12/NW | 10. Bell, D. (Interlake Dev. Corp.) | Au | Assess | VLF , Mag | 1982 | 2.4983 | - |
| Paipoonge Twp. (G680) | 52A6/SW | 11a. Belluz, B. | Ag | Assess | Man , Mech , Str | 1982 | - | - |
| Paipoonge Twp. (G680) | 52A6/SW | 11b. Belluz, B. | Ag | Assess | Man , Str | 1983 | - | - |
| Moss Twp. (G676) | 52B10/SE/SW | 12. Belore Mines | Au | Non Assess | Prog | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | 13. Bridge Resources Ltd. | Au | Assess | Mag , VLF | 1982 | 2.5274 | - |
| Hutchinson Twp. (G571) | 52B14/SW | 14a. Camflo Mines (Fern Elizabeth Gold Mines Ltd.) | Bm, Ag, As, Au | Assess | Geochem | 1981 | 2.4786 | - |
| Hutchinson Twp. (G571) | 52B14/SW | 14b. Camflo Mines Ltd. | Au | Assess | Man , Mech | 1983 | - | - |
| Hutchinson Twp. (G571) | 52B14/SW | 14c. Camflo Mines Ltd. | Au | Assess | Str | 1983 | - | - |
| Miranda Lake Area (G543) | 52B13/SW/SE | 14d. Camflo Mines Ltd. | Au | Assess | Mag , VLF | 1983 | 2.4784 | - |
| Sabawi Lake and McCaul Twp. (G554) | 52B14/SW | 14e. Camflo Mines Ltd. | Au | Assess | Mech , Man , Str | 1982 | - | - |
| Miranda Lake Area (Baker Twp.)(G543) | 52B13/SW | 15. Campbell, J.W. | Bm | Assess | Mag , VLF | 1981 | 2.4533 | - |
| Castlebar Lake Area (G220) | 42E16/SE | 16a. Canadian Nickel Co. Ltd.* | Au | Assess | GL , Mag | 1982 | 2.5540 and 2.4853 | - |

TABLE 1a Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Castlebar Lake Area (G220) | 42E16/SE | 16b. Canadian Nickel Co. Ltd. | Bm, Au | Assess | DD 1-148.13 m | 1983 | - | - |
| Haines Twp. (G662), Hagey Twp. (G661), Conacher Twp. (G646) | 52B9/NW/NE | 16c. Canadian Nickel Co. Ltd. | Bm, Au | Assess | A Mag , A Rad, AEM | 1982 | 2.5271 | - |
| Moss Twp. (G676), Burchell Lake Area (G706) | 52B10/SE | 16d. Canadian Nickel Co. Ltd. | Bm, Au | Assess | AEM, A Mag , A Rad | 1982 | 2.5270 | - |
| Ramsay-Wright Twp. (G573) | 52B14/NW | 16e. Canadian Nickel Co. Ltd. | Au, Bm | Assess | VLF, Mag , GL | 1982 | 2.5542 | - |
| Ramsay-Wright Twp. (G573) | 52B14/NW | 16f. Canadian Nickel Co. Ltd. | Au | Assess | DD 1-59.7 m | 1983 | - | - |
| Maun Lake Area (G319) | 42L7/NW | 17a. Canamax Resources Inc. | Bm, Au, Ag | Assess | GL | 1982 | 2.4861 | - |
| Metcalfe Lake Area (G84) | 42L4/NE | 17b. Canamax Resources Inc. | Bm, Au, Ag | Assess | GL | 1982 | 2.5510 | - |
| Metcalfe Lake Area (G84) | 42L4/NE | 17c. Canamax Resources Inc. | Au, Ag | Assess | GL | 1982 | 2.5511 | - |
| Terrier Lake Area (G429) | 42L10/SW | 17d. Canamax Resources Inc. | Bm, Au | Assess | GL | 1980 | 2.4860 | - |
| Terrier Lake Area (G429) | 42L10/SW | 17e. Canamax Resources Inc. | Cu, Zn | Assess | GL | 1982 | 2.4864 | - |
| Trident Lake Area (G436) | 42L7/NE | 17f. Canamax Resources Inc. | Bm, Au | Assess | GL | 1980 | 2.4862 | - |
| Trident Lake Area (G436) | 42L7/NE | 17g. Canamax Resources Inc. | Bm, Au, Ag | Assess | GL | 1980 | 2.4863 | - |
| Vincent Twp. (G163) | 42E12/NE | 17h. Canamax Resources Inc. | Bm, Au | Assess | DD 3-150 m | 1982 | - | - |
| Willet Lake Area (G156), Metcalfe Lake Area (G84), Gzowski Twp. (G182) | 42L4/NE,<br>42L5/SE,<br>42L6/SW | 17i. Canamax Resources Inc. | Cu, Zn | Assess | DD 5-1365 m | 1982 | - | - |
| Castlewood Lake Area (G22) | 42E13/NE | 18. Cane Consolidated Explor. Ltd. | Cu, Pb, Zn, Ag, Au | Assess | DD 19-925.07 m | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | 19. Caulfield Resources Ltd. | Au | Assess | VLF, Mag | 1982 | 2.5136 | - |
| Richardson Lake Area (G553) | 52G3/SE | 20. Cominco Ltd. | Au, Cu, Zn, Pb | Assess | GL, EM , Mag , SA | 1982 | 2.4562 | - |
| Pays Plat Lake Area (G606) | 42D14/NW | 21a. Corporation Falconbridge Copper | Bm, Au | Assess | Mag , VLF | 1982 | 2.5227 | - |
| Pays Plat Lake Area (G606), Rope Lake Area (G609), Lower Aguasabon Lake Area (G599), Upper Aguasabon Lake Area (G617) | 42D14/NW/NE,<br>42E3/SW/SE | 21b. Corporation Falconbridge Copper | Bm, Au | Assess | A Mag | 1982 | 2.5394 | - |
| Pays Plat Lake Area (G606) | 42D14/NW | 21c. Corporation Falconbridge Copper | Cu, Zn | Assess | DD 1-965.0 m | 1983 | - | - |
| Summit Lake Area (G136) | 42L5/NE | 21d. Corporation Falconbridge Copper | Cu, Zn, Ag | Assess | AEM, A Mag | 1981 | 2.4320 | - |
| Summit Lake Area (G136) | 42L5/NE | 21e. Corporation Falconbridge Copper | Cu, Zn | Assess | Geochem , GL | 1982 | 2.5656 | - |
| Summit Lake Area (G136) | 42L5/NE | 21f. Corporation Falconbridge Copper | Bm, Au, Ag, As, Sb, Co | Assess | SA, DD 3-491.88 m | 1983 | 2.5605 | - |
| Tyrol Lake Area (G141) | 42E13/SW | 22. Cowan, S. | Cu, Au | Assess | Geochem , VLF | 1980 | 2.5251 | - |

TABLE 1a Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Molson Lake Area (G603) | 42C12/NW | 23. Dakota Energy Corp. | Au | Assess | VLF, Mag | 1982 | 2.4981 | - |
| Molson Lake Area (G603) | 42C12/NW | 24. David Bell Geological Services Inc. (Goliath Gold Mine) | Au | Assess | EM , Mag | 1982 | 2.4982 | - |
| Rous Lake Area (G611) | 42D9/NE | 25. Devonian Resources Ltd. | Au | Assess | Mag , VLF | 1983 | 2.5547 | - |
| Lindsley Twp. (G483) | 42E11/NE | 26. Dome Explor. (Can.) Ltd. | Au | Assess | Mag ,<br>DD 2-381.5 m | 1982 | 2.5035 | - |
| Crescent Lake Area (G27) | 52I8/NW | 27. Donner, John | Ta, Li, Be, Cs, V | Assess | Geochem , SA, Man , GL | 1982 | 2.3957<br>and<br>2.4698 | - |
| Fays Flat Lake Area (G606) | 42D14/NW | 28. Duck Lake Mining Co. Ltd. | Pb, Zn, Cu | Non Assess | GL | 1952 | - | - |
| Summit Lake Area (G136) | 42L1/NE | 29. Dungarvon Resources Ltd. | Cu, Au, Ag, Pb, Zn | Assess | SA, Geochem | 1981 | 2.4760 | - |
| Rous Lake Area (G611) | 42D9/NE | 30. El Paso American Energy Corp. | Au | Assess | Mag , VLF | 1983 | 2.5549 | - |
| Vincent Twp. (G163) | 42E12/NE | 31. Elder Resources Ltd. | Cu, Pb | Assess | EM , Mag , VLF | 1983 | 2.5636 | - |
| McTavish Twp. (G675) | 52A10/SE | 32. Eldorado Nuclear Ltd. | V, Th, Bm, Ag | Assess | VLF , Rad , GL, Geochem , SA | 1981 | 2.4741 | - |
| Linklater Lake Area (G69) | 52I10/SW | 33. Esso Resources Canada | Cu, Au, Ag | Assess | GL, SA | 1981 | 2.4417 | - |
| Klotz Lake Area (G295) | 42F13/SW | 34. Explorations Banque-Or Inc. | Au, Cu, Mo | Assess | DD 37-2018.08 m | 1983 | - | - |
| Rickaby Twp. (G161) | 42E13/SE | 35a. Farakel Co. | Au, Bm | Assess | DD 10-793.50 m | 1983 | - | - |
| Walters Twp. (G171), Elmhirst Twp. (G162) | 42E12/NE, 42F13/SE | 35b. Farakel Co. | Au, Bm | Assess | DD 3-185.0 m | 1983 | - | - |
| Syine Twp. (G634) | 42D15/SW | 36. Ferguson, A. | Au, Bm | Assess | Man , Mech | 1982 | - | - |
| Middle Fox Lake Area & Yesno Twp. (G85) | 42D13/NE | 37. Fournier, E. | Au, Bm | Assess | DD 1-38.1 m | 1982 | - | - |
| Wabikoba Lake Area (G620), Molson Lake Area (G603) | 42C13/SW, 42C12/NW | 38. Gracey, K. | Au | Assess | Mag , VLF | 1983 | 2.5673 | - |
| MacGregor Twp. (G672) | 52A11/SE | 39. Grieve, M. D. | Amy | Assess | Man | 1983 | - | _ |
| Burchell Lake Area (G706) | 52B10/SE | 40. Gulf Minerals Ltd. | Cu | Assess | EM , Mag | 1980 | 2.4689 | - |
| Walters Twp. (G171) | 42E12/NE | 41a. Harte Resources Inc. | Au, Cu | Assess | Geophys | 1982 | 2.5360 | - |
| Walters Twp. (G171) | 42E12/NE | 41b. Harte Resources Inc. | Au | Assess | DD 4-234.39 m | 1983 | - | - |
| Wabikon Lake Area (G773) | 52H6/SW | 42. Hayne, W. | Bm | Assess | Man | 1983 | - | - |
| Walsh Twp. (G636), Tuuri Twp. (G635) | 42D15/SE/SW | 43. Hibbert, N., Skalesky, P., Baarts, L. | Bm, Au | Assess | EM , GL, Geophys | 1981 | 2.5099 | - |
| Oboshkegan Twp. (G173) | 42L4/NE | 44. Hollinger Argus Ltd. | Au | Assess | DD 3-171.3 m | 1981 | - | - |
| Frond Lake Area (G252) | 52P9/SW | 45. Humby, D. A. | Au, Ag | Assess | DD 1-32.61 m | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | 46. Inter-Continental Energy Corp. | Au | Assess | Mag , VLF | 1983 | 2.5551 | - |
| McTavish Twp. (G675) | 52A10/NE | 47. Josephson, A. | Amy | Assess | Mech | 1982 | - | - |
| MacGregor Twp. (G672) | 52A10/SW | 48. Karkkainen, A. | Amy, Ag | Assess | Str | 1983 | - | - |

TABLE 1a Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Frond Lake Area (G252) | 52P9/SW | 49. Reezic Resources Ltd. | Au | Non Assess | DD 91-6818.16 m | 1940-1982 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | 50. Kengate Resources Ltd. | Ag, Au, Pb, Zn, Cu | Assess | DD 21-2009.67 m | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | 51a. Lac Minerals Ltd. | Au | Assess | DD 1-132.58 m | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | 51b. Lac Minerals Ltd. | Au | Assess | DD 2-214 m | 1983 | - | - |
| Conacher Twp. (G646) | 52B9/NE | 52a. Lacana Mining Corp. | Au, Bm | Assess | Mag | 1982 | 2.5318 | - |
| Hagey Twp. (G661) | 52B9/NE/NW | 52b. Lacana Mining Corp. | Au | Assess | Mag | 1982 | 2.5422 | - |
| Henderson Lake Area (G504), Boot Bay Area (M2448) | 52B16/SW, 52B15/SE | 52c. Lacana Mining Corp. | Cu, Zn | Assess | EM , Mag | 1982 | 2.4578 | - |
| Rope Lake Area (G609) | 42E3/SW | 52d. Lacana Mining Corp. | Au, Bm | Assess | A Mag , AEM | 1983 | 2.5683 | - |
| Rous Lake Area (G611) | 42D9/NE | 53. Laco Resources Inc. | Au | Assess | Mag , VLF | 1983 | 2.5548 | - |
| Drift Lake Area (G713), Kashabowie Lake (M2405), Hagey Twp. (G661) | 52B9/NW/NE | 54. Lambert, A. (Milani, M.) | Au, Bm | Assess | Mag | 1983 | 2.5576 | - |
| Weaver Twp. (G576) | 52B14/SE | 55. Lazan Explor. & Dev. Ltd. | Ag, Au, Cu | Assess | Mag , VLF, GL | 1981 | 2.4256 | - |
| McIntyre Twp. (G674) | 52A6/NE | 56. Lenoir, A. | Ag, Pb, Zn | Assess | GL, SA, Man | 1982 | 2.5378 | - |
| Molson Lake Area (G603) | 42C12/NW | 57. Longlac Min. Explor. Ltd. | Au | Assess | Mag , VLF | 1982 | 2.5000 | - |
| Seeley Lake Area (G613) | 42D16/SW | 58. Lundmark, H. | Bst | Assess | BS | 1982 | 2.5289 | - |
| Vincent Twp. (G163) | 42E12/NE | 59a. Maki, N. R. | Au | Assess | Man , Mech | 1983 | - | - |
| Vincent Twp. (G163) | 42E12/NE | 59b. Maki, N. R. | Au | Assess | Str | 1983 | - | - |
| Ashmore Twp. (G472), McKelvie Twp. (G484) | 42E10/NE/NW | 60. Malouf, S. M. | Au | Assess | Mag , VLF | 1982 | 2.4851 | - |
| McTavish Twp. (G675) | 52A10/NE | 61. Marino, J. | Amy | Assess | Str , Man | 1982 | - | - |
| Conacher Twp. (G646) | 52B9/SE/NE | 62a. Mattagami Lake Explor. Ltd. | Au | Assess | VLF , Mag | 1980 | 2.4632 | - |
| Conacher Twp. (G646) | 52B9/SE/NE | 62b. Mattagami Lake Explor. Ltd. | Au, Ag | Assess | DD 1-46.17 m | 1981 | - | - |
| Conacher Twp. (G646) | 52B9/SE/NE | 62c. Mattagami Lake Explor. Ltd. | Au, Bm | Assess | GL | 1981 | 2.4402 | - |
| Conacher Twp. (G646), Hagey Twp. (G661) | 52B9/NE/SE | 62d. Mattagami Lake Explor. Ltd. | Au | Assess | Mag , IP , DD 10-1367.62 m | 1981 | 2.4235 | - |
| Conacher Twp. (G646), Hagey Twp. (G661) | 52B9/NE/SE | 62e. Mattagami Lake Explor. Ltd. | Au, Ag | Assess | DD 7-1242.37 m | 1982 | - | - |
| Conacher Twp. (G646) | 52B9/SE/NE | 62f. Mattagami Lake Explor. Ltd. | Bm, Au | Assess | VLF | 1983 | 2.5629 | - |
| Elmhirst Twp. (G162) | 42E13/SE | 62g. Mattagami Lake Explor. Ltd. | Au | Assess | IP | 1981 | 2.4437 | - |
| Walsh Twp. (G636) | 42D15/SE | 63. McCabe, R. J. | Bm | Assess | DD 1-31.09 m | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | 64. McIntyre Porcupine Mines Ltd. | Au, Cu, Ni | Non Assess | EM , Mag , GL | 1962 | 63.1210 | - |
| Irwin Twp. (G164) | 42E12/NW | 65a. Metalore Resources Ltd. | Au | Assess | DD 3-300.52 m | 1982 | - | - |
| Irwin Twp. (G164) | 42E12/NW | 65b. Metalore Resources Ltd. | Au | Assess | DD 4-422.76 m | 1983 | - | - |

## THUNDER BAY — NORTH CENTRAL REGION

TABLE 1a Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Santoy Lake Area (G612) | 42D15/NW, 42D14/NW | 66. Michan Explor. Inc. | Bm, Au, Ag | Assess | Mag , VLF | 1982 | 2.5507 | - |
| Conacher Twp. (G646) | 52B9/NE/SE | 67. Milani, M. | Bm, Au | Assess | Mag | 1983 | 2.5578 | - |
| Vincent Twp. (G163) | 42E12/NE | 68. Mining Corp. of Canada Ltd. | Au | Non Assess | GL | 1928 | - | - |
| Norway Lake Area (G545) | 52G3/SE/SW | 69a. Mining North Explor. Ltd. | Bm, Au | Assess | GL , Geochem | 1982 | 2.5212 | - |
| Norway Lake Area (G545) | 52G3/SW | 69b. Mining North Explor. Ltd. | Au, Bm | Assess | VLF, Mag | 1982 | 2.4820 | - |
| Richardson Lake Area (G551) | 52G3/SE | 69c. Mining North Explor. Ltd. | Au, Bm | Assess | VLF, Mag | 1982 | 2.4820 | - |
| Trottier Twp. and Crooked Pine Lake Area (G519) | 52B14/SE | 69d. Mining North Explor. Ltd. | Au, Bm | Assess | VLF, Mag | 1982 | 2.4820 | - |
| Ashmore Twp. (G472) | 42E10/NW | 70. Moore, W. G., Swereda, M. F. | Au, Bm | Assess | Mech , Str | 1983 | - | - |
| Pijitawabik Bay and Kilkenny Twp. (G111) | 52H8/NE | 71. Nama Creek Mines Ltd. | Li | Non Assess | GL | 1955 | - | - |
| Lapierre Lake Area (G65) | 42E14/SW/SE | 72a. Nelson, B. | Bm, Au | Assess | VLF | 1982 | 2.4821 | - |
| Lapierre Lake Area (G65) | 42E14/SW | 72b. Nelson, B. | Bm | Assess | Mag | 1983 | 2.5574 | - |
| Vincent Twp. (G163) | 42E12/NE | 72c. Nelson, B. | Au | Assess | Geophys | 1982 | 2.5127 | - |
| Vincent Twp. (G163) | 42E12/NE/SE | 72d. Nelson, B. | Au | Assess | Str , Man | 1983 | - | - |
| Ratte Lake Area (G119) | 52I10/SE/SW | 73a. New Jersey Zinc Explor. (Can.) Ltd. | Bm | Assess | EM , Mag , Gr | 1981 | 2.4838 | - |
| Snowdrift Lake Area (G402) | 52P10/SW | 73b. New Jersey Zinc Explor. (Can.) Ltd. | Au, Sr | Assess | EM , Mag , Gr | 1982 | 2.4517 | - |
| Greenwich Lake Area (M2621) | 42E12/SW | 74. New Senator-Rouyn Ltd. | Cu, Mo | Non Assess | Tr | 1966 | - | - |
| Cairngorm Lake Area (G585) | 42E2/SW | 75a. Noranda Explor. Co. Ltd. | Zn | Assess | EM , Mag | 1982 | 2.4560 and 2.4574 | - |
| Dorion Twp. (G651) | 52A15/SE | 75b. Noranda Explor. Co. Ltd. | Zn, Pb | Assess | Mag , IP | 1982 | 2.4979 | - |
| Dorion Twp. (G651) | 52A15/SE | 75c. Noranda Explor. Co. Ltd. | Pb, Zn | Assess | GL | 1982 | 2.5352 | - |
| Finlayson Lake Area (G528) | 52B13/NE | 75d. Noranda Explor. Co. Ltd. | Cu, Ni, Zn | Assess | EM , Mag , Geochem | 1982 | 2.5072 and 2.5073 | - |
| Finlayson Lake Area (G528) | 52B13/NE | 75e. Noranda Explor. Co. Ltd. | Au, Ag | Assess | DD 1-107.59 m | 1983 | - | - |
| Foxtrap Lake Area (G592) | 42D15/NE | 75f. Noranda Explor. Co. Ltd. | Cu, Zn, Pb, Ag | Assess | GL , Geochem | 1982 | 2.4618 | - |
| Hay Lake Area (G728) | 52G2/SE | 75g. Noranda Explor. Co. Ltd. | Bm | Assess | EM , Mag | 1982 | 2.5076 | - |
| Killala Lake Area (G596) | 42E2/SE | 75h. Noranda Explor. Co. Ltd. | Cu | Assess | GL | 1982 | 2.4616 | - |
| Loken Lake Area (G597) | 42F4/NE | 75i. Noranda Explor. Co. Ltd. | Bm | Assess | EM , Mag | 1981 | 2.4092 | - |
| Pays Plat Lake Area (G606), Rope Lake Area (G609) | 42D14/NW, 4[illegible]3/SW | 75j. Noranda Explor. Co. Ltd. | Bm, Au | Assess | EM | 1981 | 2.4842 | - |
| Oboshkegan Twp. (G173), Metcalfe Lake Area (G84) | 42L4/NE | 75k. Noranda Explor. Co. | Bm | Assess | EM , VLF, Mag | 1982 | 2.4491 | - |

TABLE 1a Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Pays Plat Lake Area (G606), Rope L. Area (G609) | 42D14/NW, 42E3/SW | 75l. Noranda Explor. Co. Ltd. | Cu, Zn, Au | Assess | Geochem , SA, GL | 1982 | 2.4624 and 2.5288 | - |
| Rope Lake Area (G609) | 42E3/SW | 75m. Noranda Explor. Co. Ltd. | Bm, Au | Assess | Mag , VLF | 1982 | 2.5075 | - |
| Wabikoba Lake Area (G620) | 42C13/SW | 75n. Noranda Explor. Co. Ltd. | Cu, Pb, Zn | Assess | DD 6-648.0 m | 1983 | - | - |
| Wolf Lake Area (G1[illegible]0), Dorion Twp. (G651) | 52A15/SE | 75o. Noranda Explor. Co. Ltd. | Pb, Zn, Ba | Assess | GL, DD 8-216.5 m | 1982 | 2.5491 | - |
| Foch Lake Area (G591) | 42F3/NW | 76a. Noranda Mines Ltd. | Bm | Assess | VLF , Mag , GL | 1982 | 2.4944 | - |
| Kagiano River Area (G595) | 42E1/NE | 76b. Noranda Mines Ltd. | Bm | Assess | EM , Mag | 1981 | 2.4297 | - |
| Kagiano River Area (G595) | 42E1/NE | 76c. Noranda Mines Ltd. | Cu, Zn, Ag, Au | Assess | GL | 1982 | 2.5426 | - |
| Loken Lake Area (G597) | 42F4/NE | 76d. Noranda Mines Ltd. | Bm | Assess | GL | 1981 | 2.4705 | - |
| Loken Lake Area (G597), Olie Lake Area (G605) | 42F4/NE, 42F5/SE | 76e. Noranda Mines Ltd. | Bm | Assess | EM , Mag | 1981 | 2.4135 | - |
| Loken Lake Area (G597) | 42F4/NE | 76f. Noranda Mines Ltd. | Bm, Au, Ag | Assess | EM , Mag , GL , VLF | 1982 | 2.5264 and 2.5535 | - |
| Loken Lake (G597), Foch Lake Area (G591) | 42F4/NE, 42F3/NW | 76g. Noranda Mines Ltd. | Bm | Assess | GL | 1982 | 2.4730 | - |
| Loken Lake Area (G597), Olie Lake Area (G605) | 42F4/NE, 42F5/SE | 76h. Noranda Mines Ltd. | Au, Bm | Assess | GL | 1982 | 2.4866 | - |
| Loken Lake Area (G597), Foch Lake Area (G591) | 42F4/NE, 42F3/NW | 76i. Noranda Mines Ltd. | Cu, Zn, Ag, Au | Assess | DD 7-1033.38 m | 1983 | - | - |
| Loken Lake Area (G597), Olie Lake Area (G605) | 42F4/NE, 42F5/SE | 76j. Noranda Mines Ltd. | Cu, Zn, Ag, Au | Assess | DD 7-1595.93 m | 1983 | - | - |
| Manitouwadge Lake Area (G600) | 42F4/NW | 76k. Noranda Mines Ltd. | Bm | Assess | VLF | 1981 | 2.4704 | - |
| Manitouwadge Lake Area (G600) | 42F4/NW | 76l. Noranda Mines Ltd. | Cu, Ag, Zn | Assess | DD 2-2714.09 m | 1982 | - | - |
| McTavish Twp. (G675) | 52A15/SE | 77a. Moyes, G. | Amy | Assess | Man | 1982 | - | - |
| McTavish Twp. (G675) | 52A15/SE | 77b. Moyes, G. | Amy | Assess | Man , Str | 1983 | - | - |
| McTavish Twp. (G675) | 52A15/SE | 77c. Moyes, G. | Amy | Assess | Mech | 1983 | - | - |
| Elbow Lake Area (G33) | 42L4/SW/SE | 78. Oja, R. V. | Au | Non Assess | DD 3-99.36 m | 1961 | - | - |
| McComber Twp. (G166), Summers Twp. (G165) | 42E11/SW/NW | 79a. Pancontinental Mining (Can.) Ltd. | Au | Assess | GL , Str | 1982 | 2.4504 | - |
| Summers Twp. (G165), McComber Twp. (G166) | 42E12/SW/NW | 79b. Pancontinental Mining (Can.) Ltd. | Au | Assess | DD 6-549.0 m | 1983 | - | - |
| Linklater Lake Area (G69) | 52I10/SW | 80. Peterson, T. | Bm, Au | Assess | Man | 1982 | - | - |
| Dorion Twp. (G651) | 52A15/SE | 81. Petrunka, D. | Pb, Zn | Assess | DD 8-216.48 m | 1982 | - | - |
| Castlewood Lake Area (G22) | 42E13/NE | 82. Pollack, J. | Bm, Au | Assess | Str | 1983 | - | - |
| Veekay Lake Area (G440) | 42M12/SE/SW | 83. Pricemore Resources Inc. | Au, W | Assess | EM , Mag | 1981 | 2.4327 | - |
| Blake Twp. (G645), Crooks Twp. (G648) | 52A3/NW | 84. Prince Silver Mine | Ag | Non Assess | GL , SA | 1903 | - | - |

**TABLE 1a Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Rous Lake Area (G611) | 42D9/NE | 85. Rabbit Oil & Gas Ltd. | Au | Assess | VLF , Mag | 1983 | 2.5478 | - |
| Gorham Twp. (G660) | 52A11/SW/SE | 86. Redden, J. W. | Cu, Au | Assess | GL , Geochem | 1981 | 2.4737 and 2.4738 | - |
| Rous Lake Area (G611) | 42D9/NE | 87. Rhodes Resources Inc. | Au | Assess | Mag , VLF | 1982 | 2.5521 | - |
| Molson Lake Area (G603) | 42C12/NW | 88a. Schiralli, R. A. (Golden Sceptre) | Au | Assess | DD 10-3027.0 m | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | 88b. Schiralli, R. A. (Goliath and Golden Sceptre) | Au | Assess | DD 9-2571.17 m | 1983 | | - |
| Molson Lake Area (G603) | 42C12/NW | 88c. Schiralli, R. A. (Golden Sceptre) | Au | Assess | DD 3-2024.3 m | 1983 | - | - |
| Rous Lake Area (G611), Molson Lake Area (G603) | 42D9/NE, 42C12/NW | 88d. Schiralli, R. A. | Au, Mo | Assess | GL | 1982 | 2.5101 | - |
| Rous Lake Area (G611), Molson Lake Area (G603) | 42D9/NE, 42C12/NW | 88e. Schiralli, R. A. (Golden Sceptre Resources Ltd.) | Au | Assess | DD 4-968 m | 1983 | | |
| Laponen Lake (G300), McBean Lake (G321) | 42E10/NE | 89. Shell Canada Resources Ltd. | Au | Assess | Mag | 1982 | 2.4590 | - |
| Willet Lake Area (G156) | 42L5/SE, 42L4/NE | 90. Sherritt Gordon Mines Ltd. | Bm, Au | Assess | EM , Mag | 1981 | 2.4441 | - |
| Alfred Lake and McQueston Twp. (G189) | 42E15/SW | 91. Shields, J. | Au, Bm | Assess | Man | 1983 | - | - |
| Goldie Twp. (G658) | 52A12/NW | 92a. Skalesky, P. J., Peterson, T., Peterson, W. | Feld | Assess | SA | 1982 | 2.5377 | - |
| Goldie Twp. (G658) | 52A12/NW | 92b. Skalesky, P., Peterson, T., Peterson, W. | Feld | Assess | Mech | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | 93. Southern Union Resources Inc. | Au | Assess | Mag , VLF | 1983 | 2.5546 | - |
| Sabawi Lake Area and McCaul Twp. (G554) | 52B14/SW | 94. Staines, L. B. | Bm | Assess | EM , Mag | 1980 | 2.4409 | - |
| Falcon Lake Area (G35) | 52I8/NE, 52I9/SE | 95a. Steep Rock Mines Ltd. | Au | Non Assess | GL , Mag | 1966 | - | - |
| Freeborn Twp. (G570) | 52B11/SE | 95b. Steep Rock Iron Mines Ltd. | Au | Assess | Mag , EM | 1981 | 2.4659 | - |
| Hepburn Lake Area and Tanner Twp. (G532) | 52C9/NE, 52C16/SE | 95c. Steep Rock Iron Mines Ltd. | Au | Assess | Geophys | 1981 | 2.4657 | - |
| Hepburn Lake Area (G532) | 52C16/SE, 52C9/NE | 95d. Steep Rock Iron Mines Ltd. | Au, Cu, Ni, Zn | Assess | EM , Mag | 1982 | 2.5294 | - |
| Norway Lake Area (G545) | 52G3/SW | 95e. Steep Rock Iron Mines Ltd. | Au, Cu, Ni | Assess | EM , Mag | 1981 | 2.4658 | - |
| Schwenger Twp. (G574), Steep Rock Lake Area (G560) | 52B13/SE, 52B14/SW, 52B12/NE | 95f. Steep Rock Iron Mines Ltd. | As, Cu, Ag, Au, Zn | Assess | SA | 1981 | 2.4736 | - |
| Schwenger Twp. (G574) | 52B13/SE, 52B14/SW | 95g. Steep Rock Iron Mines Ltd. | Au | Assess | GL | 1981 | 2.4527 | - |
| Schwenger Twp. (G574) | 52B13/SE | 95h. Steep Rock Iron Mines Ltd. | Au | Assess | DD 2-197.36 m | 1982 | - | - |

**TABLE 1a Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Schwenger Twp. (G574) | 52B13/SE,<br>52B14/SW | 95i. Steep Rock Iron Mines | Au | Assess | DD 1-96.25 m | 1982 | - | - |
| Pic Twp. (G630) | 42D9/NW | 96a. Stenlund, V. | Mo | Assess | DD 2-261.51 m | 1983 | - | - |
| Walsh Twp. (G636) | 42D15/SE | 96b. Stenlund, V. | Bm, Au | Assess | DD 1-32.31 m | 1983 | - | - |
| Blackwell Twp. (G644), Laurie Twp. (G669) | 52A12/SW | 97. Stewart, M. A., Lundmark, N. | Au | Assess | GL , VLF | 1982 | 2.5436 | - |
| Walsh Twp. (G636) | 42D15/SE | 98. Stralak Resources Inc. | Pb, Zn | Assess | DD 2-161.05 m | 1983 | - | - |
| O'Sullivan Lake Area (G362) | 42L6/NE | 99. Sutherland, W. D. (Odessa Explor. Ltd.) | Bm, Au | Assess | AEM , A Mag | 1982 | 2.5391 | - |
| Opikeigan Lake Area (G361), Ferguson Lake Area (G249) | 52P9/NE,<br>NW | 100a. Tantalum Mining Corp. of Can. Ltd. | Ta, Bm | Assess | EM , Mag | 1981 | 2.4805 | - |
| Opikeigan Lake Area (G361), Ferguson Lake Area (G249) | 52P9/NW/<br>SW,NE | 100b. Tantalum Mining Corp. of Can. Ltd. | Ta, Li | Assess | DD 13-1243.58 m | 1981 | - | - |
| Boot Bay Area (M2448) | 52B15/SE | 101a. Teck Explor. Ltd. | Au | Assess | EM , Mag | 1981 | 2.4586<br>and<br>2.4587 | - |
| Boot Bay Area (M2448) | 52B15/SE,<br>52B16/SW | 101b. Teck Explor. Ltd. | Au | Assess | Mag , EM | 1981 | 2.4589 | - |
| Boot Bay Area (M2448) | 52B15/SE | 101c. Teck Explor. Ltd. | Au | Assess | Mag , EM | 1981 | 2.4593 | - |
| Boot Bay Area (M2448) | 52B15/SE | 101d. Teck Explor. Ltd. | Au, Ag | Assess | Mag | 1981 | 2.4596 | - |
| Lower Aguasabon Lake Area (G599) | 42D14/NE | 101e. Teck Explor. Ltd. | Au, Bm | Assess | EM , Mag | 1983 | 2.5620,<br>2.5622,<br>2.5623,<br>and<br>2.5624 | - |
| Molson Lake Area (G603) | 42C12/NW | 101f. Teck Explor. Ltd. | Au | Assess | Mag , VLF | 1982 | 2.5340 | - |
| Norway Lake Area (G545) | 52G3/SW | 101g. Teck Explor. Ltd. | Bm, Au | Assess | Mag , VLF, EM | 1981 | 2.4588 | - |
| Richardson Lake Area (G553) | 52G3/SE | 101h. Teck Explor. Ltd. | Au | Assess | Mag , EM | 1981 | 2.4594 | - |
| Richardson Lake Area (G553) | 52G3/SE | 101i. Teck Explor. Ltd. | Bm, Au | Assess | Mag , EM | 1981 | 2.4595 | - |
| Tuuri Twp. (G635) | 42D15/SW | 101j. Teck Explor. Ltd. | Cu, Zn,<br>Au, Ag | Assess | DD 3-335.82 m | 1983 | - | - |
| Croll Twp. (G491) | 42E10/NW | 102. Theriault, O. | Bm, Au | Assess | DD 2-72.05 m | 1983 | - | - |
| Burchell Lake Area (G706) | 52B10/SE | 103. Thew, R. | Bm | Assess | Man , Mech , Str | 1982 | - | - |
| Rous Lake Area (G611) | 42D9/NE | 104. Thompson, D. W. | Au | Assess | VLF , Mag | 1982 | 2.5453 | - |
| Leduc Twp. (G169) | 42E12/NE | 105a. Thorsteinson, D. | Au, Ag | Assess | SA | 1982 | 2.4986 | - |
| Walters Twp. (G171) | 42E12/NE | 105b. Thorsteinson, D. | Au, Ag | Assess | DD 3-307.24 m | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | 106. Triple Crown Resources Ltd. | Au | Assess | Mag , VLF | 1983 | 2.5479 | - |
| Cockeram Twp. (G184) | 52H2/SE | 107. Tri-Ven Mineral Corp. | Bm, Au | Assess | Man , Str | 1983 | - | - |
| Irwin Twp. (G164) | 42E12/NW | 108a. Umex Inc. | Au, Bm | Assess | Mag , Rad , VLF , GL | 1981 | 2.4287 | - |
| Sandra Twp. (G167) | 42E12/NW | 108b. Umex Inc. | Au, Bm | Assess | Rad , Mag , VLF , GL | 1981 | 2.4288 | - |

TABLE 1a Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Wabikoba Lake Area (G620) | 42C13/SW | 109. Vanstates Resources Ltd. (Western Pacific Energy Corp.) | Au | Assess | Mag., VLF | 1983 | 2.5688 | - |
| Wabikoba Lake Area (G620) | 42C13/SW | 110. Vulcan Resources Ltd. | Au | Assess | EM , Mag | 1982 | 2.4831 | - |
| Dainty Lake Area (G225) | 42M16/NW | 111a. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , Mag | 1981 | 63.3980 | - |
| Dainty Lake Area (G225) | 42M16/NW | 111b. Wasabi Resources Ltd. | Cu, Au, Ni | Assess | DD 1-109 m | 1983 | - | - |
| East of Norton Lake Area (G237) | 42M14/NE | 111c. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Gittens Lake Area (G256) | 42M16/SW | 111d. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Mabie Lake Area (G313) | 42M15/NE | 111e. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Mabie Lake Area (G313) | 42M15/NE | 111f. Wasabi Resources Ltd. | Au, Cu | Assess | DD 1-96.32 m | 1983 | - | - |
| Mabie Lake Area (G313), Tillett Lake Area (G432) | 42M15/NE/NW | 111g. Wasabi Resources Ltd. | Au, Cu | Assess | DD 3-303.28 m | 1983 | - | - |
| Norton Lake Area (G355) | 42M14/NW | 111h. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Norton Lake Area (G355), Tillett Lake Area (G432), Mabie Lake Area (G313), Hale Lake Area (G265), E. of Norton Lake Area (G237) | 42M14/NW/NE, 42M 15/NE/NW, 43D2/SW | 111i. Wasabi Resources Ltd. | Au, Cu | Assess | Geophys , EM , Mag | 1981 | 2.4671 | - |
| Oxtoby Lake Area (G365) | 42M15/SE | 111j. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Tillett Lake Area (G432) | 42M15/NW | 111k. Wasabi Resources Ltd. | Cu, Ni, Au | Assess | GL , Geochem , EM , VLF , A Mag | 1981 | 63.3980 | - |
| Pyramid Lake Area (G550) | 52G2/SW, 52G3/SE | 112. Wicheruk, M. | Au, Bm | Assess | Str | 1982 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | 113a. Yzerdraat, W. | Au, Bm, As | Assess | VLF , Geochem | 1981 | 2.4186 and 2.4577 | - |
| Metcalfe Lake Area (G84) | 42L4/NE | 113b. Yzerdraat, W. | Bm | Assess | VLF , Mag | 1982 | 2.4949 and 2.5108 | - |

TABLE 1b

WORK REPORTS RECEIVED IN 1983

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Priske Twp. (G631), Syine Twp. (G634) | 42D14/SE, 42D15/SW | Asarco Explor. Co. of Can. Ltd. | - | Assess | GL | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Aurelian Developers | - | Assess | AEM , A Mag | 1983 | - | - |
| Burchell Lake Area (G706) | 52B10/SE | Belore Mines | Au, Bm | Assess | Mag | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Boos, B. | Au | Assess | Mag , VLF | 1983 | - | - |
| Hagey Twp. (G661) | 52B9/NE | Calvert, D. (Greenwich Lake Explor. Ltd.) | - | Assess | EM , Mag | 1983 | - | - |
| Rous Lake Area (G611), Pic Twp. (G630) | 42D9/NE, NW | Cameron, K. | - | Assess | A Mag , AEM , GL | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Campbell, B. | - | Assess | EM , Mag | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Cannon Mines Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Caulfield Resources Ltd. | - | Assess | Geochem | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Caulfield Resources Ltd. | - | Assess | IP | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Caulfield Resources Ltd. | - | Assess | GL | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Chavin of Can. Ltd. (Houston, C., Bumbu, M.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Walsh Twp. (G636) | 42D15/SE | Chavin of Can. Ltd. | - | Assess | A Mag , AEM , A VLF | 1983 | - | - |
| Colter Twp. (G477), Lindsley Twp. (G483) | 42E11/NE/NW | Cominco | - | Assess | OVD | 1983 | - | - |
| Pays Plat Lake Area (G606) | 42D14/NW | Corporation Falconbridge Copper | - | Assess | Geochem | 1982 | - | - |
| Summit Lake Area (G136) | 42L5/NE | Corporation Falconbridge Copper | - | Assess | GL | 1983 | - | - |
| Tyrol Lake Area (G141) | 42E13/SW | Cowan, S. | - | Assess | GL | 1983 | - | - |
| McComber Twp. (G166), Vincent Twp. (G163) | 42E12/SW/SE | Craskie Mines Ltd. (Douglas, G. B.) | - | Assess | EM , Mag | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Dakota Energy Corp. | - | Assess | Geochem | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Dakota Energy Corp. | - | Assess | Geochem , SA , GL | 1982 | - | - |
| Wild Potato Lake Area (G565), Bedivere Lake Area (G511) | 52C9/NE, 52B15/SE | Davidson, B., and Sawdo, P. | - | Assess | EM | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Dodds, J. V. (Lampo Resources Co. Ltd.) | - | Assess | Mag | 1983 | - | - |
| Legault Twp. (G170), Leduc Twp. (G169) | 42E11/NW, 42E12/NE | Dome Explor. (Can.) Ltd. | - | Assess | DD | 1982 | - | - |
| Summit Lake Area (G136) | 42L5/NE | Dungarvon Resources Ltd. | - | Assess | SA | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Esso Resources Can. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | Farakel Co. | - | Assess | VLF | 1983 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | Farakel Co. | - | Assess | VLF , IP | 1983 | - | - |
| Kaby Lake Area (G59) | 42E13/SE | Farakel Co. | - | Assess | VLF | 1983 | - | - |

**TABLE 1b Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Rickaby Twp. (G161), Raby Lake Area (G59) | 42E13/SE | Farakel Co. | - | Assess | VLF | 1982 | - | - |
| Rickaby Twp. (G161), Elmhirst Twp. (G162), Walters Twp. (G171) | 42E13/SE | Farakel Co. | - | Assess | Mag , VLF | 1982 | - | - |
| Rickaby Twp. (G161) | 42E13/SE | Farakel Co. | - | Assess | VLF , IP | 1983 | - | - |
| Rickaby Twp. (G161) | 42E13/SE | Farakel Co. | - | Assess | VLF | 1983 | - | - |
| Walters Twp. (G171) | 42E12/NE | Farakel Co. | - | Assess | VLF | 1983 | - | - |
| Walters Twp. (G171) | 42E12/NE | Farakel Co. | - | Assess | VLF , IP | 1983 | - | - |
| Tuuri Twp. (G635) | 42D15/SW | H. Ferderber Geophysics Ltd. | - | Assess | EM , Mag | - | - | - |
| Rope Lake Area (G609), Upper Aguasabon Lake Area (G617) | 42E3/SW/SE | Flintrock Mines Ltd. | - | Assess | A Mag , A EM | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Flyer Resources Ltd. (McGowan, R. J.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Hagey Twp. (G661) | 52B9/NE | G.L.E. Resources Ltd. | - | Assess | Mag , VLF | 1982 | - | - |
| Molson Lake Area (G603), Wabikoba Lake Area (G620) | 42C12/NW/NE | Gracey, K. A. | - | Assess | EM , Mag | 1983 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | Grant, J. S. | - | Assess | Mag , VLF | 1983 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | Grant, J. | - | Assess | Mag , VLF | 1983 | - | - |
| Hagey Twp. (G661) | 52B9/NE | Greenwich Lake Explor. Ltd. | - | Assess | EM , Mag , IP | 1982 | - | - |
| Hagey Twp. (G661) | 52B9/NE | Greenwich Lake Explor. Ltd. | - | Assess | EM , Mag , IP | 1982 | - | - |
| Syine Twp. (G634) | 42D15/SW | Hahn, P. | - | Assess | Geochem | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Hawkins, S. G. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Hemlo Explor. Ltd. | - | Assess | Mag , VLF | 1983 | - | - |
| Wabikoba Lake Area (G620), Black River Area (G580) | 42C13/SW/NW | Hibbart, N. | - | Assess | EM , Mag | 1983 | - | - |
| Frond Lake Area (G252) | 52P9/NW | Humby, D. A. | - | Assess | Mag , EM | 1982 | - | - |
| Pays Plat Lake Area (G606) | 42D14/NW | Kalrock Developments Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Kasner, R. J. | - | Assess | EM , Mag | - | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Kasner, R. J. | - | Assess | EM , Mag | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Kondrat, J. | - | Assess | EM , Mag | 1983 | - | - |
| Tib Lake Area (M2911) | 52H4/NW | Kuhner, K. | - | Assess | Mag , GL , Geochem | 1982 | - | - |
| Upper Aquasabon Lake Area (G617), Rope Lake Area (G609) | 42E3/SE/SW | Lacana Mining Corp. | - | Assess | AEM , A Mag | 1983 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Laprairie, L. F. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Priske Twp. (G631) | 42D14/SE | Lormac Explor. Ltd. | - | Assess | Mag , VLF | 1983 | - | - |

TABLE 1b Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Blackwell Twp. (G644), Laurie Twp. (G669) | 52A12/NW/SW | Lundmark, H. | - | Assess | GL , VLF | 1982 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Lynx Canada Explor. Ltd. | - | Assess | EM , Mag , GL | - | - | - |
| Molson Lake Area (G603) | 42C12/NW | Lynx Canada Explor. Ltd. | - | Assess | Mag , VLF | 1983 | - | - |
| Tuuri Twp. (G635) | 42D15/SW | Marathon Minerals Inc. | - | Assess | Mag , VLF | 1983 | - | - |
| Elmhirst Twp. (G162) | 42E13/SE | Maruska, E. | - | Assess | DD | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | McGowan, R. J. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Wabikoba Lake Area (G620), Molson Lake Area (G603) | 42C13/SW, 42C12/NW | McGowan, R. J. | - | Assess | GL | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | McGowan, R. J. | - | Assess | GL | 1983 | - | - |
| Irwin Twp. (G164) | 42E12/NW | Metalore Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Irwin Twp. (G164) | 42E12/NW | Metalore Resources Ltd. | - | Assess | GL | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Michano, J. G. | - | Assess | A Mag , AEM | 1983 | - | - |
| Castlebar Lake Area (G220), Pagwachuan Lake Area (G368) | 42E16/SE, 42E9/NE | Mid North Eng. Serv. Ltd. | - | Assess | Mag | - | - | - |
| White Lake Area (N. Part) (G622) | 42C13/SE | Midnapore Resources (McGowan, R. J.) Ltd. | - | Assess | GL | 1983 | - | - |
| Norway Lake Area (G545) | 52G3/SW | Mining North Explor. Ltd. | | Assess | SA | 1982 | - | - |
| Rous Lake Area (G611) | 42D9/NE | Murray, R. B. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Hagey Twp. (G661) | 52B9/NE | Narex Ore Search Consultants Inc. | - | Assess | Mag | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | National Trust Co. Ltd. | - | Assess | EM | 1983 | - | - |
| Gravel River Area (G45) | 42E4/SE | Nelson, J. | - | Assess | DD | - | - | - |
| Tyrol Lake Area (G141) | 42E13/SW | Nelson, J. S. | - | Assess | EM | 1982 | - | - |
| Dorion Twp. (G651), Wolf Lake Area (G160) | 52A15/NE/SE | Noranda Explor. Co. Ltd. | - | Assess | Mag , IP | 1982 | - | - |
| Dorion Twp. (G651) | 52A15/SE | Noranda Explor. Co. Ltd. | - | Assess | GL , Geochem , Mag | 1983 | - | - |
| Lower Aguasabon Lake Area (G599) | 42D14/NE | Noranda Explor. Co. Ltd. | - | Assess | EM , A Mag | - | - | - |
| Lower Aguasabon Lake Area (G599) | 42D14/NE | Noranda Explor. Co. Ltd. | - | Assess | AEM , A Mag | 1983 | - | - |
| McTavish Twp. (G675) | 52A10/NE | Noranda Explor. Co. Ltd. | - | Assess | GL , Geochem | 1983 | - | - |
| Middle Fox Lake Area & Yesno Twp. (G85), Gravel River Area (G45) | 42D13/NE | Noranda Explor. Co. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Pays Plat Lake Area (G606), Rope Lake Area (G609) | 42D14/NW, 42E3/SW | Noranda Explor. Co. Ltd. | - | Assess | SA | - | - | - |
| Pays Plat Lake Area (G606), Priske Twp. (G631), Killraine Twp. (G625) | 42D14/SE/NW/SW | Noranda Explor. Co. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |

## THUNDER BAY — NORTH CENTRAL REGION

TABLE 1b Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Pays Plat Lake Area (G608), Rope Lake (G609) | 42D14/NW, 42E3/SW | Noranda Explor Co. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Pays Plat Lake Area (G608), Rope Lake Area (G609) | 42D14/NW, 42E3/SW | Noranda Explor Co. Ltd. | - | Assess | AEM , A Mag | 1983 | - | - |
| Pays Plat Lake Area (G608) | 42D14/NW | Noranda Explor Co. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Rope Lake Area (G609) | 42E3/SW | Noranda Explor Co. Ltd. | - | Assess | AEM , A Mag | 1983 | - | - |
| Upper Aguasabon Lake Area (G613), Lower Aguasabon Lake Area (G[illegible]) | 42E3/SE, 42D14/NE | Noranda Explor Co. Ltd. | - | Assess | A Mag , AEM | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Noranda Explor Co. Ltd. | - | Assess | Mag | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Noranda Explor Co. Ltd. | - | Assess | Geochem | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Noranda Explor Co. Ltd. | - | Assess | IP , Res | 1983 | - | - |
| Manitouwadge Lake Area (G[illegible]) | 42F4/NW, NE | Noranda Mines Ltd. | - | Assess | GL , Geochem | 1983 | - | - |
| Tyrol Lake Area (G141) | 42E13/SW | Northern Concentrators (M. E. Cowan) | - | Assess | GL | 1983 | - | - |
| Tyrol Lake Area (G141) | 42E13/SW | Northern Concentrators (Michael Ernest Cowan) | - | Assess | Mag , VLF | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Northern Eagle Mines Ltd. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Strey Twp. (G[illegible]) | 42D14/SE | [illegible] Ontario Ltd. (Melrose Terrace Bay) | - | Assess | GL | 1983 | - | - |
| Hous Lake Area (G611) | 42D9/NE | [illegible] Ontario Incorporated | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Pic Twp. (G630), Mussy Lake Area (M29) | 42D9/NW, SE | [illegible] Ontario Ltd. (Maple Leaf Petroleum Ltd.) | - | Assess | Mag , VLF | 1983 | - | - |
| Hous Lake Area (G611) | 42D9/NE | Opsal, F., Kohn, S. | - | Assess | Mag , VLF | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Pawnee Oil Corp. | - | Assess | EM , Mag | 1983 | - | - |
| Wolf Lake Area (G160), Dorion Twp. (G[illegible]) | 52A15/SE, NE | Petrunka, D. | - | Assess | GL | 1982 | - | - |
| Pic Twp. (G630) | 42D9/NW | Pezim, M., Clemiss, A. | - | Assess | EM , Mag , VLF | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Pezim, M., Clemiss, A. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Pezim, M., Clemiss, A., (Kadrey Energy Corp.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Pezim, M. | - | Assess | AEM , A Mag | - | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Pezim, M. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Recoskie, F., Bremner, D., Bellemare, Y. | - | Assess | Mag , VLF , IP , GL , Geochem | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Recoskie, F. E., (Robert, Y. R.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW, NE | Rose Resource Corp. | - | Assess | Mag , VLF | 1983 | - | - |
| Tuuri Twp. (G635) | 42D15/SW | Salo, R. | - | Assess | EM , Mag | 1983 | - | - |

TABLE 1b Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Mussy Lake Area (M29) | 42D9/SE | Schiralli, R. | - | Assess | EM , Mag | 1983 | - | - |
| Squire Twp. (G634), Strey Twp. (G633) | 42D15/SW,<br>42D14/SE | Schiralli, R. A. | - | Assess | AEM , A VLF<br>A Mag | - | - | - |
| Tuuri Twp. (G635) | 42D15/SW | Schiralli, R. A. | - | Assess | AEM , A VLF<br>A Mag | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Schiralli, R. A. | - | Assess | Mag , VLF | 1982 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Seemar Mines Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Stenlund, V. | - | Assess | SA | - | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Teck Explor. Ltd. | - | Assess | Mag | - | - | - |
| Strey Twp. (G633) | 42D14/SE | Teck Explor. Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Tuuri Twp. (G635) | 42D15/SW | Teck Explor. Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Walsh Twp. (G636) | 42D15/SE | Teck Explor. Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Castlewood Lake Area (G22), Coughlan Lake Area (G26) | 42E13/NE | Thorsteinson, D., Cox, N. | - | Assess | DD , EM , Mag | 1982 | - | - |
| Fround Lake Area (G252) | 42F9/NW | Tough, S. | - | Assess | EM , Mag | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Tylox Resources Corp. | - | Assess | Mag , VLF | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Tylox Resources Corp. | - | Assess | Mag , VLF | 1983 | - | - |
| White Lake Area (N. Part) (G622) | 42C13/SE | Tylox Resources Corp. | - | Assess | EM , Mag | 1983 | - | - |
| Priske Twp. (G631) | 42D14/SE | United Continental Energy Corp. (Livingston Energy Corp.) (Korba, E.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| White Lake Area (N. Part) (G622) | 42C13/SE | Ventora Resources Ltd. (McGowan, R. J.) | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Dainty Lake Area (G225) | 42M16/NW | Wasabi Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Gittins Lake Area (G256) | 42M16/SW | Wasabi Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Mable Lake Area (G313) | 42M15/NE | Wasabi Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Mable Lake Area (G313) | 42M15/NE | Wasabi Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Oxtoby Lake Area (G365) | 42M15/SE | Wasabi Resources Ltd. | - | Assess | EM , Mag | 1983 | - | - |
| Tuuri Twp. (G635) | 42D15/SW | Wasabi Resources Ltd. | - | Assess | AEM , A Mag , A VLF | 1983 | - | - |
| Pic Twp. (G630) | 42D9/NW | Wildcat Petroleum Ltd. | - | Assess | A VLF, AEM , Mag | 1983 | - | - |
| Killraine Twp. (G625) | 42D14/SW | Wilson, A., Bond, J. E., Mocnik, D. M. | - | Assess | AEM , A Mag , Mag , GL , Geochem | 1983 | - | - |
| Wabikoba Lake Area (G620) | 42C13/SW | Woynarski, J. | - | Assess | EM , Mag | 1983 | - | - |
| White Lake Area (N. Part) (G622) | 42C13/SE | Woynarski, J. | - | Assess | EM , Mag | 1983 | - | - |
| Molson Lake Area (G603) | 42C12/NW | Wright, R. J. | - | Assess | EM , Mag | 1982 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yserdraat, W. | - | Assess | Res | 1982 | - | - |

TABLE 1b Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Geochem | 1982 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Geochem | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Res | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Res | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Res | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Res | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Geochem | 1983 | - | - |
| Metcalfe Lake Area (G84) | 42L4/NE | Yzerdraat, W. | - | Assess | Geochem | 1983 | - | - |
| Metcalfe Lake Area (G84), Oboshkegan Twp. (G173) | 42L4/NE/SE, 42L3/NW/SW | Yzerdraat, W. | - | Assess | Geochem | 1983 | - | - |
| Metcalfe Lake Area (G84), Oboshkegan Twp. (G173) | 42L4/NE/SE, 42L3/NW/SW | Yzerdraat, W. | - | Assess | Geochem | 1983 | - | - |
| Metcalfe Lake Area (G84), Oboshkegan Twp. (G173) | 42L4/NE/SE, 42L3/NW/SW | Yzerdraat, W. | - | Assess | Res | 1983 | - | - |
| Pays Plat Lake Area (G606) | 42D14/NW | Zanavy Mines Ltd. | - | Assess | A Mag , AEM | 1982 | - | - |

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1. | Canamax | Geology on Milestone Prospect, Klotz Lake Area |
| 2. | Corporation Falconbridge Copper | Diamond drilling N.W.T. Cu-Zn-Ag Deposit, Marshall Lake Area |
| 3. | Dome Exploration Limited | Diamond drilling on Jellicoe Mine, Lindsley Township |
| 4. | E. & B. Canady | Stripping and trenching on Wenzoski gold occurrence, Walters Township |
| 5. | Gold Range Prospect (W. Acker Claims) | Grid cut by persons unknown |
| 6. | Great Western Petroleum Corporation and Anglo Canadian Mining Corporation | Diamond drilling, geophysics, geology and sampling, Cowan Mill, Pifher Township |
| 7. | Lac Minerals (Williams option) | Diamond drilling, trenching, mapping, I.P. survey, geochemistry |
| 8. | Litton Minerals Limited (Ontario Paper option) | Mapping, geochemistry, trenching |
| 9. | Lynx-Canada Explorations Limited | Diamond drilling on Tashota-Nipigon Mine, Onaman Lake Area |
| 10. | Metalore Resources Limited | Geology and diamond drilling on Brookbank prospect, Irwin Township |
| 11. | Mining Corporation of Canada Limited | Diamond drilling on Consolidated Louanna Gold Mine, O'Sullivan Lake |
| 12. | Ontario Company 530260 | Bulk sampling Brenbar Mine, Irwin Township |
| 13. | Roxmark Mines Limited - Sherritt-Gordon Mines Limited | Dewatering and diamond drilling on Magnet Consolidated Mine, Errington Township |
| 14. | Stroud Resources | Geology, stripping and sampling on Tyson Mine, Dorothea Township |
| 15. | Tombill Mines Limited | Geophysics on Craskie prospect, Vincent Township |
| 16. | Turner Energy and Resources Limited | Diamond drilling, geology and stripping, Greenoaks prospect, Pifher Township |
| 17. | United Continental Resources Limited (Clem Downey claims) | Prospecting, stripping, trenching and sampling |
| 18. | United Continental Resources Limited and New Ambrose Resources Incorporated (Morley Pyrite Occurrence) | Prospecting and road improvements |

Tri-Ven Minerals Corporation, Thunder Bay, personal communication, 1983).

Rok Engineering Limited is operating a granite quarry, 3 km north of Highway 17 just to the east of Highway 614. The material is being used as aggregate.

## Claim Staking and Exploration Activity

The total number of claims staked in the North Central Region was 15 870 (to November 30, 1983), which represents a 30% increase over the number of claims staked in 1982. The number of active claims as of November 30, 1983, stood at 33 871 (Table 3). This represents a record for the North Central Region only approached during the Manitouwadge rush in the 1950s.

A more accurate representation of the exploration activity is the number of man days of assessment work filed, 664,891 (Tables 1a and 1b). This approximates the accumulated total that has been filed in the last 5 years in the North Central Region.

Much of the increased exploration activity can be attributed to activity in the Hemlo area and to the economics of gold. Normally, a major discovery such as Hemlo results in a staking rush which engulfs the "greenstone belt" in which the deposit is located. However, the Hemlo rush represents more than just "on strike" staking. Rather, it represents the application of new geological concepts to gold exploration. These are outlined below. This has wide ranging effects on exploration in the Archean of Ontario, and elsewhere. In essence, it has changed the mineral potential of supracrustal metasediments, estimated to constitute 5 to 10% of the Archean "greenstones", from moderate to high potential and opened up opportunities for exploration in untested areas.

## Hemlo Area

### Introduction

The Hemlo area is located 35 km east of Marathon, adjacent to the Trans-Canada Highway 17, and 4 km west of the turnoff to Manitouwadge (Highway 614). Three

TABLE 3 SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT

| Year | Claims Recorded | Claims Cancelled | Claims Active | Diamond Drilling Man Days | Geophysical Surveys Man Days | Geological Surveys Man Days | Total Man Days |
|---|---|---|---|---|---|---|---|
| 1972 | 3,442 | 5,091 | 8,184 | 61,512.2 | 53,757.5 | 4,776 | 131,393 |
| 1973 | 2,213 | 5,515 | 4,922 | 49,575 | 24,320 | 7,450 | [illegible] |
| 1974 | 5,305 | 3,391 | 5,837 | 37,130.5 | 26,061 | 4,300 | 80,559.4 |
| 1975 | 3,436 | 2,869 | 5,404 | 38,652 | 53,020 | 4,700 | 105,338 |
| 1976 | 2,364 | 3,552 | 6,079 | 52,551.6 | 29,304 | 4,600 | 101,025.6 |
| 1977 | 1,964 | 2,966 | 5,077 | 24,879 | 25,601 | 4,870 | 68,727 |
| 1978 | 3,517 | 1,982 | 6,612 | 20,182 | 20,589 | 6,206 | 51,299 |
| 1979 | 3,099 | 2,139 | 7,554 | 11,528 | 69,612 | 14,727 | 101,799 |
| 1980 | 5,527 | 1,836 | 11,245 | 53,418 | 57,483 | 5,372 | 127,288 |
| 1981 | 6,768 | 4,162 | 13,851 | 55,256 | 172,366 | 13,863 | 256,686 |
| 1982 | 10,226 | 4,613 | 19,349 | 133,035 | 114,805 | 24,437 | 292,273 |
| 1983 (to end of Nov.) | 15,870 |  | 33,871 | 104,107 | 418,730 | 415,448 | 568,285 |

properties (covering portions of one single large deposit), the International Corona Resources Limited property (optioned to Teck Corporation), the Williams property (optioned to Lac Minerals Limited), and the Goliath-Golden Sceptre Joint Venture property (optioned to Noranda Mines Limited), are under development. Noranda Mines Limited is sinking a 5-compartment shaft to 1435 m and is constructing a 1000 tonnes-per-day mill that will be expanded to 3000 tonnes per day in 1987. Teck Corporation is in the process of clearing the shaft site and plans to collar the shaft (990.6 m) in early December 1983. Lac Minerals Limited have let contracts for a feasibility study; initial plans are for a 2500 to 3000 ton-per-day mill.

In addition to the development of 3 mines, approximately 100 companies have been carrying out exploration programs in the area. Through the Ontario Mineral Exploration Program (OMEP), the Ontario Government has designated 40 programs in the Hemlo area totalling $8 622 830 with OMEP grants for $2 070 715.

## Exploration History

Exploration began in the Hemlo area in 1869, near the present Town of Heron Bay, where 2 veins were discovered by Moses Pe-Kong-Gay. The veins were shown to A. Cyrette and W. Pritchard in 1872, who reported the occurrence to Captain W. Frue (from Silver Islet). A number of shafts were sunk and some ore shipped (McKellar 1874); currently, the property is optioned to Lytton Minerals Limited.

In the 1920s, J. LeCour, Station Agent at Hemlo, sank a number of test pits on a mineralized shear zone (Bel-Air Resources Limited's property) just north of the Hemlo Station. At about the same time, a series of trenches were dug to the north of mile-post 38 on the Canadian Pacific Railway mainline by persons unknown (currently, on Golden Sceptre Resources Limited's property).

The region was first mapped by J.E. Thomson of the Ontario Department of Mines in 1931. He recommended two areas for exploration: Manitouwadge and northeast of Hemlo. Moses Fisher (who had guided J.E. Thomson to Manitouwadge) made a discovery on the western half of the present Lac Minerals Limited ground. He showed the property to a Mr. Ollmann of Heron Bay. A block of 11 claims were staked by J.K. Williams of Maryland, apparently in partnership with Ollmann in September of 1945. The adjacent ground, now comprising the International Corona Resources Limited property, was staked by T. Page, M. Bartley, Moses Fisher, A. Halliday, and J.K. Williams. Lake Superior Mining Corporation Limited was formed in 1947, to develop the property with W. Tomas as President. Work, consisting of mapping, trenching, and diamond drilling was carried out on both the Williams property and adjoining Lake Superior Mining Corporation Limited's property under the direction of T. Page. In 1951, the Lake Superior Mining Corporation Limited property was optioned to Teck-Hughes Gold Mining Limited. They drilled 6000 feet defining 89 000 tons at 0.27 ounce gold per ton (Canadian Mines Handbook) on the present west ore zone of Corona. Further drilling was undertaken in 1957 and 1959. The company was dissolved in February 1965.

The International Corona Resources Limited property was staked for short periods of time by 4 individual prospectors. No exploration work was filed for assessment credits. In April of 1973, Ardel Explorations Limited staked the property. They completed a further 3 holes and revised the tonnage (west zone of Corona) to 150 000 tons at 0.21 ounce gold per ton (The Northern Miner, February 14, 1974). The company charter of Ardel Exploration Limited was cancelled and the property was restaked by R.G. Newman in 1976. These claims were cancelled in January of 1978.

The area remained open until March of 1980, when it was staked by J. Larche in partnership with D. McKinnon.

They optioned the property to Mr. Schiralli, who in turn optioned the property to International Corona Resources Limited. At about the same time, the adjacent ground was staked by J. Larche and D. McKinnon, and optioned to Goliath Gold Mines Limited and Golden Sceptre Resources Limited. An exploration program under the direction of D. Bell resulted in the discoveries of the east ore zone of International Corona Resources Limited (optioned to Teck Corporation in November 1981) and the Goliath deposit (optioned to Noranda Mines Limited in November 1982). The Williams claims were optioned to Lac Minerals Limited in 1981. Drilling in the winter of 1982 outlined a deposit. Currently, 3 mines are being brought into production.

## General Geology

The area has been mapped by the Ontario Geological Survey and the former Ontario Department of Mines (Thomson 1931; Milne 1967, 1968; Muir 1982a, 1982b). This mapping has defined an east-trending belt of Archean metasediments and metavolcanics (part of the Wawa Subprovince) forming a broad synform, with granitic intrusions along the axis. The Quetico Gneiss Belt lies to the north and the Pukaskwa Gneiss Complex to the south. Muir (1982a) divided the belt into 2 main sequences near the Town of Heron Bay. The northern Heron Bay sequence consists predominantly of intermediate to felsic metavolcanics and metasediments. The metavolcanics consist of flows, pyroclastic breccia, and tuff. The coarsest pyroclastic rocks occur near Heron Bay. Toward the east, the pyroclastic rocks gradually become finer grained with a higher component of reworked material (tuffaceous fragments). Near Hemlo, argillaceous metasediments begin to interfinger with the tuffs and tuffaceous metasediments. Further to the east near Struthers, the siltstones predominate. The southern Playter Harbour sequence consists of mafic pillowed metavolcanics (high-iron tholeiites) which have been intruded by ultramafic sills.

In addition to the main felsic centre at Heron Bay, several satellitic felsic centres (or accumulations) consisting of crystal tuffs to pyroclastic breccia were mapped by Bartley (1958). All these centres occur in the Heron Bay sequence at or near the contact with Playter Harbour series.

1. The Moose Lake centre forms a wedge-shaped body 450 m thick near Botham Lake and tapering to the east of Moose Lake where the pyroclastic rocks interfinger with sediments. Mapping by Noranda Mines Limited shows the pile is cut off to the west by a fault near Botham Lake. The predominant rock type is a crystal tuff (feldspar-quartz porphyry) with minor units of lapilli-tuff. The Hemlo deposit occurs on the northern contact of the crystal tuff where it interfingers with metasediments east of Moose Lake.
2. The Theresa Lake centre is located in a west-trending pile, 8 km long at the southern end of Theresa Lake. The felsic pyroclastic rocks are predominately crystal tuffs (quartz-feldspar porphyries) with minor amounts of lapilli-tuff.
3. The White River centre occurs in a west-trending wedge-shaped pile, 3 km south of Rust Lake and extends east past the White River.
4. The Pic River centre is located 6 km northeast of Marathon. It forms a block of felsic pyroclastic breccias 6 km north-south and 4 km east-west. Pelitic sediments occur in a unit 1 km wide between the felsic pyroclastic rocks and mafic pillowed volcanic rocks to the north and east.

Associated with each of these centres are conglomeratic rocks with clasts of local derivation.

## Structural Geology

The large scale structure of the Hemlo Belt can be described as a synform with granitic intrusions (Heron Bay pluton and the Cedar Lake pluton) occurring along the fold axis. In detail, however, the structure is more complicated (Patterson 1983b). The predominant fabric in the fragmental rocks is a lineation with a secondary foliation. This lineation appears to show a systematic variation across the southern half of the belt. Near Heron Bay, the plunge of lineation is 45°W; the plunge gradually steepens to the east, being near vertical near the hamlet of Hemlo, and then 45°E near White River.

Minor folding is common with observed closures on a scale of up to 40 m. Foliation is parallel to the fold plane and the lineation to the fold axis. Both the lineation and foliation described above are folded near Heron Bay. A large scale M-fold can be observed on airphotos with a closure of 5 km. Refolded minor folds were observed along the access road into Pukaskwa Park (mushroom-shaped interference figures). This suggests a number of phases of deformation.

Brittle deformation (faulting and shearing) commonly occurs along the contact of brittle and ductile rocks, subparallel to bedding. The Hemlo fault can be traced from Moose Lake to the Struthers (12 km), roughly parallel to the Trans-Canada Highway. Near Finger Lake, the fault is indicated by 1 to 3 m of chloritic schist.

## Deposit Stratigraphy

This section represents a summary based on work by R. Quartermain (Teck Corporation), G. Pierce (Noranda Mines Limited), and B. Valliant (Lac Minerals Limited). For detailed information the reader is referred to Quartermain *et al.* (1983), Sheehan and Valliant (1983), and Noranda Staff (1983). During the summer, outcrops representative of typical units were washed, stripped, and mapped. A geological road guide is in preparation by G.C. Patterson.

The general trend of the units is 110°, with a dip of 45°N to 55°N; some isoclinal folding is evident. Top indicators show reversals with the majority of the units facing north. The base of the sequence is arbitrarily taken to be the southern contact between a thin unit of mafic volcanic rocks and metasediments (Muir 1982b), south of Moose Lake.

The section below describes the highway exposure; distances are across strike and do not represent true thickness:

0 - 75 m: Mafic metavolcanics consisting of massive to strongly deformed pillowed volcanic rocks. The northern contact of the mafic metavolcanics is the Hemlo fault.

75 - 175 m: Calc-silicate metasediment. Originally a finely bedded marl which has been converted by metamorphism to rock composed of calcium-rich plagioclase and amphibole (tremolite to hornblende).

175 - 180 m: Altered crystal tuff (quartz-sericite schist) composed of quartz crystals 2 to 5 mm in size (up to 10%) in a fine-grained matrix of sericite and quartz, containing minor pyrite and tourmaline. This unit was called the Lake Superior south zone by Page (1947). At depth, it contains economical gold values (lower zone of the Goliath deposit).

180 - 220 m: Siltstones with minor calc-silicates containing some magnetite-rich members up to 4 cm wide. This unit serves a stratigraphic marker due to its magnetic response.

220 - 270 m: Crystal tuff (quartz-eye sericite schists). Locally the unit is bedded, with individual beds defined by the density and size of quartz crystals. The quartz-eyes up to 3 mm in size are commonly sheared and deformed.

270 - 290 m: The ore zone section is described in the section on "Property Descriptions". The rocks in the unit are siliceous metasediments, altered tuffs, and fragmental rocks. It was referred to as the Lake Superior shear zone by Page (1947).

290 - 390 m: Reworked tuffs with units of pelite and calc-silicate.

390 - 480 m: Pyroclastic rocks consisting of crystal tuffs and associated conglomerates. The upper section of this unit is a crystal tuff with pyrrhotite and pyrite (locally called "The Barren Sulfide Zone or the Sucker Zone").

480 - 600 m: Pelitic sediments with units of calc-silicate and siltstone.

600 - 650 m: Crystal tuffs and conglomerates.

650 - 900 m: Calc-silicates and siltstones (locally folds with closures of 40 m have been noted).

All rocks in the section are cut by diabase dikes. Feldspar porphyry and coarse-grained feldspar porphyry intrude parallel to foliation.

## Size and Grade of the Hemlo Deposit

The total of combined published reserves on the Hemlo deposit is 76 367 679 tons at 0.24 ounce gold per ton. These figures can be broken down as follows:

(1) Noranda Mines Limited (from Globe and Mail, December 20, 1983)

| | |
|---|---|
| Goliath Property: | |
| Upper or Main Zone | 19 681 410 tons<br>at 0.29 oz/ton Au |
| Lower Zone | 1 643 089 tons<br>at 0.17 oz/ton Au |
| Teck Corporation ¼ Claim optioned to Noranda Mines Limited: | |
| Upper or Main Zone | 2 235 704 tons<br>at 0.30 oz/ton Au |
| Lower Zone | 187 476 tons<br>at 0.30 oz/ton Au |
| Total: | 23 867 679 tons at 0.28 oz/ton Au |

(2) Lac Minerals Limited (from Globe and Mail, December 14, 1983)

| | |
|---|---|
| Zone A | 3 850 000 tons<br>at 0.18 oz/ton Au |
| Zone B | 38 150 000 tons<br>at 0.20 oz/ton Au |
| Total: | 42 000 000 tons at 0.20 oz/ton Au |

(3) Teck Corporation (The Northern Miner, October 13, 1983)

| | |
|---|---|
| East Zone | 8 400 000 tons<br>at 0.36 oz/ton Au |

## Property Descriptions

### Goliath Gold Mines Limited

The geology of the main deposit has been described by Noranda Staff (1983):

*The main ore zone is composed of a diverse group of stratabound, pyrite-rich siliceous and locally barite-rich metasediments. They are of probably chemical sedimentary derivation. The mineralized zone ranges from 3 to 40 m and is characterized by sheet-like regularity and by remarkably consistent gold values varying from 4 to 16 grams per tonne. Gold occurs as finely disseminated native gold in the pyritiferous schists. The grade is not dependent on iron sulphide content. The ore-bearing rocks contain appreciable molybdenite. Accessory minerals such as stibnite, realgar, and a light green mica thought to contain titanium, vanadium and/or barium, are characteristic of the deposit. The deposit displays a distinct vertical zoning of layering. Hanging wall sediments grade downward into a molybdenum-rich siliceous schist, then into mixed siliceous, baritic, and locally sericitic schist. Then into a basal lower grade barite-rich horizon.*

Further:

*The main ore horizon can be traced laterally along strike into a pyritiferous volcanoclastic unit. This distinctive unit has stretch-*

> *ed quartz-feldspar-porphyry fragments and fewer metasediment and cherty clasts, all set in a quartz-feldspar-biotite matrix. It has high background gold values.*
>
> *The deposit is underlain by an intensely altered succession of quartz-eye sericite schists with variable amounts of tourmaline, pyrite, rutile and often abundant green mica. A series of feldspar and quartz porphyry sills and dikes intrude both the ore horizon and footwall schists.*

Garth Pierce (Project Geologist, Noranda Mines Limited, Winnipeg, personal communication, 1983) noted that realgar, orpiment, and cinnabar occur on the margins of late quartz veins, suggesting that these minerals formed late. Longitudinal sections prepared by Noranda Mines Limited show a high grade core containing abundant molybdenite, barite, stibnite, and arsenic minerals. This core trends to the northwest, straddling the western boundary with the Lac Minerals Limited property. A summary of the mineralogy of the deposit is given in Table 4.

A second mineralized horizon (The Lake Superior South ore zone or the Goliath lower zone) has been intersected 30 to 80 m below the main ore zone. Garth Pierce (Project Geologist, Noranda Mines Limited, personal communication, 1983) states the internal zoning is very similar to the main zone.

Recent drill results (The Northern Miner, September 1, 1983) include:

| | | |
|---|---|---|
| NGG-31WB | 2.9 feet | 0.088 oz/ton Au |
| NGG-31X | 16.0 feet | 0.666 oz/ton Au |
| NGG-33AW | 2.5 feet | 0.094 oz/ton Au |
| NGG-37W | 9.8 feet | 0.843 oz/ton Au |
| NGG-37X | 8.4 feet | 0.329 oz/ton Au |
| NGF-38WB | 8.3 feet | 0.148 oz/ton Au |
| NGG-39WB | 13.3 feet | 0.206 oz/ton Au |
| NGG-40 | 8.1 feet | 0.186 oz/ton Au |
| NGG-40W | 18.7 feet | 0.789 oz/ton Au |

## International Corona Resources Limited

The geology of the International Corona Resources Limited Deposit was summarized by Quartermain *et al.* (1983):

> *The mineralization is confined to the contact between felsic vol-*

TABLE 4 THE MINERALOGY OF THE GOLIATH DEPOSIT (FROM UNPUBLISHED NORANDA MINES LIMITED BOOKLET, RESIDENT GEOLOGIST'S FILES, ONTARIO MINISTRY OF NATURAL RESOURCES, THUNDER BAY).

Silicates, Sulphates, Carbonates, Oxides

Quartz - $SiO_2$: total $SiO_2$ = 55 percent, 40 to 70 percent range
Barite - $BaSO_4$: 12 percent average, 0 to 40 percent range
Micas - K,Al,Fe,Mg,(V),(Ti),OH, silicates: 5 to 30 percent
Feldspars - K,Na,Ca,Al,(Ba), silicates: 0 to 15 percent
Calcite - $CaCO_3$: 0 to 15 percent
Rutile - $TiO_2$, and Sphene - $CaO,TiO_2,SiO_2$: 0.3 to 0.4 percent
Chlorite, Amphibole - Fe,Mg,(Al),(Ca),(Na),OH, silicates: moderate to minor
Tourmaline, Diopside, Sillimanite, Garnet, Staurolite, Epidote - silicates: minor

Common Sulphides and Graphite

Pyrite - $FeS_2$: 8 percent average, 5 to 20 percent range
Molybdenite - $MoS_2$: 0.16 percent average, 0.03 to 0.40 percent range
Sphalerite - ZnS: Zn = 0.008 percent average, 0.003 to 0.024 percent range
Chalcopyrite - $CuFeS_2$: Cu = 0.002 percent average, 0.001 to 0.004 percent range
Pyrrhotite - $FeS_x$: traces
Graphite - C: 0.04 percent average, trace - 0.12 percent range

Gold-Bearing Minerals

Native Gold - Au (Ag = 0 to 20 percent): Au = 10 grams/tonne
Aurostibnite - $AuSb_2$: several grams/tonne in part of drill hole NGG-14

Antimony, Arsenic, and Mercury-Bearing Minerals

Stibnite - $Sb_2S_3$: minor but widespread; Sb = 0.02 percent average, 0.01 to 0.16 percent range
Native Antimony - Sb: traces
Berthierite - $FeSb_2S_4$: traces
Gudmundite - FeSbS: traces
Jamesonite - $FePbS_2$: traces
Boulangerite - $Pb_5Sb_4S_{11}$: traces
Chalcostibnite - $CuSBS_2$: traces
Tetrahedrite - $(Cu,Fe,Zn,Ag,Hg)_{12}(Sb,As)_4S_{13}$: minor to traces; 0 to 2 percent Ag
Arsenopyrite - FeAsS: trace
Native Arsenic - As: trace

> *canics to the south and clastic sedimentary rocks to the north. The two ore zones are enclosed by intermediate-felsic lapilli tuff. This lapilli tuff is structurally and stratigraphically(?) underlain by massive rhyodacite and by quartz-eye felsic crystal tuff, both of which thicken from east to west. The hanging wall consists of siltstone, argillite, conglomerate and minor felsic tuff. Alteration, characterized primarily by the development of white mica in the footwall and in the ore horizon felsic volcanics, appears to be pre-tectonic and hydrothermal, and increases in intensity from east to west.*

Further:

> *The gold in the East Zone occurs as very fine (0.4 mm diameter), discrete grains, is usually associated with fine-grained, disseminated pyrite and molybdenite and is hosted by laminated silty subgreywacke. In the West Zone, the auriferous silty subgreywacke is discontinuous and occurs as lensoid segments seperated by lower grade quartz-feldspar-whitemica-fuchsite(?)-tourmaline schist. Possible clasts of East Zone-type material occur sporadically in the sedimentary hanging wall.*

R. Quartermain (Project Geologist, Teck Corporation Limited, personal communication, 1983) has suggested the presence of clasts of East Zone mineralized siliceous metasediments in the lapilli-tuff unit, supports the concept of an unconformity within the deposit stratigraphy.

## Lac Minerals Limited

The general geology was described by Sheehan and Valliant (1983):

> *The orebody is within a sequence from oldest to youngest of massive and fragmental basalt, massive parallel and cross-laminated psammitic turbidite which becomes progressively finer-grained stratigraphically upward. These rocks strike 110° and dip 60° north and are intruded by feldspar porphyritic felsic plugs and related dykes and sills. All rocks are intruded by Late Archean north-trending diabase dykes. The orebody is stratiform at the contact of underlying tourmaline-rich quartz crystal tuff and overlying arsenopyrite-staurolite-rich turbidite and in places transgresses both rock types. Ore consists of stratified quartz, muscovite, pyrite-rich rock and muscovite, amphibole, biotite, pyrite-rich turbidite. Accessory minerals include garnet, staurolite, molybdenite, stibnite, arsenopyrite, magnetite and sphene.*

The main Williams deposit (Zone A) has been trenched exposing the ore zone. Alex Matzok (Project Geologist, Lac Minerals Limited, Hemlo, personal communication, 1983) described the ore zone from the hanging wall (northern contact) to the footwall (southern contact). The hanging wall rocks consist of altered sediments, pelitic in composition, and contain arsenopyrite. This is followed by 2 to 3 m of massive pyrite, low in gold. The upper siliceous zone (5 m thick) is composed of a gold-bearing siliceous metasediment containing Ba-muscovite, barite, molybdenite, and 2 to 5% pyrite. This is in contact with a fragmental rock (10 m thick) consisting of 30 to 50% disrupted layers and fragments of siliceous metasediments in a pyritic matrix. Within the fragmental unit are bands of highly deformed sericite schist (altered tuffs) that contain stibnite and cinnabar. The base of the ore zone is another gold-bearing siliceous sediment similar to the upper siliceous unit. The footwall rock (from drill core) consists of a quartz-eye sericite schist (altered tuffs). All rocks are cut by fine-grained feldspar porphyry sills.

A second deposit was announced by Lac Minerals Limited in The Northern Miner (September 1983 p.1); few details have been given. The deposit occurs in the western half of the Williams block and appears to be on a strike continuation of the "Golden Sceptre Fracture Zone" (*see* below).

## Summary of Gold Deposits

The Hemlo deposits occur at the contact between crystal tuffs and metasediments, where the crystal tuffs wedge out against the metasediments. The metasediments consist of graded siltstone, pelites, reworked tuffs, and calc-silicates. The crystal tuffs near the deposit are altered, and now contain sericite, tourmaline, green mica, barite, and hematite. The pelitic composition of the metasediments may be, in part, derived from alteration. The host rocks are sericite schists (altered crystal tuffs), siliceous metasediments, and fragmental rocks.

The ore mineralogy consists of pyrite, molybdenite, native gold, stibnite, arsenopyrite, cinnabar, orpiment, and realgar. The mineralization is zoned both across dip and along strike. Across dip zoning in the Goliath deposit consists of a molybdenite-rich siliceous schist in the hanging wall, then mixed siliceous, baritic and sericitic schists to a baritic unit in the footwall. An apparent zonation along strike can be seen when comparing the Goliath deposit with the Corona East Zone and Williams deposit. The Goliath deposit appears to represent a core rich in Au, Mo, Sb, Ba, As, and Hg with a rim (Corona, East Zone) rich in Au and Mo. Current grade and tonnage estimates are 76.4 million short tons at 0.24 ounce gold per ton.

## Origin

Most workers in the area suggest the deposit is penecontemporaneous with volcanism, being a syngenetic or an epithermal deposit. The epithermal model has a number of modifications:

1. Hot Spring solution deposits—a chemical sediment rich in metal deposited at or near a vent. A number of modern equivalents have been described in New Zealand (Weissberg 1969). Both the metal associations (gold, arsenic, antimony, and mercury) and the alteration pattern are similar to Hemlo.
2. The deposition of metal-rich sediments within porous units such as unwelded tuffs, fragmentals, and fault zones. This class can be thought of as the fissure system associated with hot springs. Examples of deposits of this group include: those near Goldfield, Nevada, which occur in tuffs (Boyle 1979); and the Getchell deposit, Nevada, or the Gold Acres deposit, Nevada, which are associated with fault zones (Joralemon 1975).
3. The deposition of metal within chemically favourable rocks—the Carlin deposit, Nevada, is associated with

the replacement of limestones by silica. Similar deposits occur in ultramafic rocks which have undergone carbonatization and later reacted with epithermal solutions (Henderson 1969).

In comparing the Hemlo deposit to epithermal deposits, there are a number of clear similarities. The metal association at Hemlo and in epithermal deposits are similar (gold, molybdenite, arsenic, antimony, mercury, and barium are major constituents). Alteration in epithermal deposits consists of silicification, and deposition of tourmaline, sericite, K-feldspar, biotite, and kaolin. Direct comparison of alteration at Hemlo is difficult due to the masking by amphibolite grade metamorphism. However, tourmaline, sericite, microcline, and silicification are present. At Hemlo, kaolin-rich rocks may be represented by pelites. Many of the hot springs systems in New Zealand and Nevada are associated with felsic volcanic rocks and porphyry dikes both of which are present at Hemlo.

It is not clear which of the modifications on the epithermal model is most applicable or if more than one mechanism was operative. The occurrence of clasts of ore-bearing sediments in fragmental rocks tends to support the assumption that primary metal-rich sediments were formed. However, a large part of the orebody occurs in fragmental rocks or tuffs which would have a high initial porosity. As well, there are abundant carbonate rocks overlying the ore zone that could act as a chemical trap. It is to be noted that the Goliath deposit contains an average of 0.04% graphite (Table 4).

In this discussion, the role of deformation should not be overlooked. The mineralized horizon occurs at the contact between a brittle unit and a ductile unit. Thus, the deformation, focused on this horizon, could generate the porosity which could be a trap for mineralizing solutions. The role of deformation in the origin or modification of the deposit has not been determined.

The application of the epithermal model has obvious implications to other areas such as Timmins and Red Lake where carbonates generated by the alteration of volcanic rocks or ultramafic rocks may have formed a chemical trap for epithermal solutions.

## Gold Occurrences in the Hemlo Area

### Golden Sceptre Resources Limited

The property extends as a band 3.2 km wide by 9.7 km long to the west of the property of International Corona Resources Limited. The property was optioned to Noranda Exploration Company in November 1982. Three mineralized zones have been discovered during an exploration program which included geological mapping, trenching, an Induced Polarization survey, and soil geochemistry. One of the zones (the Fracture Zone) is located 800 m north of Highway 17, on the eastern boundary with Lac Minerals Limited's property. The Fracture Zone is "hosted" in quartz veins which cut a quartz porphyry. This zone appears to be on strike with mineralization discovered during the 1950s on the western side of Lac Minerals Limited's property (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The mineralization consists of native gold, molybdenite, pyrite, and telluride minerals. Initial diamond drilling has intersected a number of high grade (up to 3.36 ounces gold per ton) zones over narrow widths (1.6 to 4.9 feet; George Cross Newsletter, Number 204, October 25, 1982). The eastern, strike extension to Lac Minerals Limited Williams property, appears to be the deposit announced in The Northern Miner (September 15, 1963, p.1).

The second zone is located 150 m north of the first zone. It is defined by an east-trending soil geochemical anomaly. Assays of diamond drill core are as follows: Hole 4, 21 feet of 0.33 ounce gold per ton; and Hole 19, 36 feet of 0.325 ounce gold per ton (The Northern Miner, November 18, 1982).

Recent drilling has extended the zone 2.4 km further west (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) to Botham Lake. Although no assays are reported, references to green mica, molybdenite, stibnite, and pyrite are made.

The third zone, the Highway Zone, was sampled by Muir (1982b) and assayed 0.32 ounce gold per ton. Mineralization consists of pyrite, native gold, and minor molybdenite, and is hosted in volcanoclastic metasediments. The unit is up to 2 m wide and can be traced from Moose Lake to Finger Lake, a distance of 3 km. The volcanoclastic metasediment consists of 50% fragments of feldspar porphyry, chert, and altered volcanic rocks, 2 mm to 5 cm in size, which have been stretched up to 15:1 parallel to foliation. The matrix contains sericite, green mica, and tourmaline.

### Goliath Gold Mines Limited

The property surrounds the International Corona Resources Limited property on 3 sides (the east, north, and south).

To the east, 100 m south of Struthers, mapping has indicated the presence of molybdenite and pyrite in a sericite schist on strike with "the Corona East Ore Zone". Recent diamond drilling by Noranda Mines Limited has intersected sericite schist containing molybdenite and stibnite, no assays have been reported (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

A number of quartz veins containing minor molybdenite occur on Highway 17 to the east of the Noranda access road and on the Manitouwadge Railway spur 1.5 km south of Highway 17. Quartz veins up to 10 cm wide cut metasediments near the contact with the Cedar Lake Pluton. A number of similar occurrences have been reported on other properties in the area.

## Heron Bay Gold Mine and Bowhill Mines Occurrence

Lytton Minerals Limited have optioned the Heron Bay Gold Mine and Bowhill Mines occurrence from V. Stenlund. Trenching has more clearly exposed a quartz-carbonate vein system at 3 known locations on the property:

1. The Heron Bay Mine is located 250 m west of Highway 627, just south of the Canadian Pacific Railway line. During the period 1870 to 1880, several shafts and a small open cut were sunk from which a small tonnage of gold ore was produced (McKellar 1874). Trenching exposed a vein system (10 to 80 cm wide) which trends at 110° to 190° and can be traced 200 m. Shearing in the host rock is oblique to the vein system and is confined to the northern side of the vein. Samples of vein when slabbed show several generations of vein development: (a) barren white quartz; (b) carbonate rich; (c) tourmaline and sulphide bearing; (d) banded quartz-carbonate and barite. Sulfides identified are galena, chalcopyrite, pyrite, and molybdenite. Host rocks consist of coarse felsic pyroclastic rocks which appear bleached near the vein. A chip sample ran 0.22 ounce gold per ton and 3.00 ounces silver per ton across 0.82 m (McIlwaine *et al.* 1982, p.52).
2. Approximately 200 m to the south a second vein, parallel to those at the Heron Bay Mine vein, has been stripped and trenched along strike for 40 m. The vein, hosted in felsic breccias, is from 0.25 to 1 m wide and is composed of quartz-carbonate with pyrite, galena, and tourmaline.
3. The Bowhill Mines occurrence is located 800 m west of Highway 627, 150 m south of the Canadian Pacific Railway. In 1937, Bowhill Mines Limited (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) reported an open cut had been made 200 feet by 9 feet wide by 25 feet deep. A 500-pound test shipment of ore to the Ottawa Ore Dressing Laboratory ran 0.30 ounce gold per ton and 1.53 ounce silver per ton.

Current mapping carried out by Derry, Michener, Booth and Wahl Consultants has identified 8 "auriferous pyritic quartz sericite ± talc units". Two of these are currently the focus of exploration. All zones trend east-west. The main zone (3 to 6 m wide) occurs at the contact between a felsic agglomerate and a felsic tuff breccia containing mafic fragments. The south zone (2 m wide), 150 m south of the main zone, is hosted in felsic agglomerate. Both zones have been traced for 1 km. The mineralization at the Bowhill occurrence is located in the main zone while that at the Heron Bay Gold Mine occurs to the north of the main zone. The trench at location (2) is in the south zone. Assay results across these zones are typically in the range of 0.02 to 0.06 ounce gold per ton across 0.4 to 1 m (Field Trip Guide, Peekongay Property, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

## Knut Kuhner Occurrence

The occurrence is located 1 km south of Page Lake (locally referred to as "¾ Mile Lake"), 10 km northeast of the Marathon Airport on the property of Gowganda Resources Incorporated. The geology of the property was mapped by Milne (1967). It is underlain by felsic pyroclastic rocks on the west and mafic volcanic rocks on the east. Metasediments, graphitic schists, pelites, cherts, and massive sulphides occur between the felsic and mafic volcanic rocks. A lake bottom sediment geochemistry sampling program (Geological Survey of Canada, Open File 746) shows a large copper, lead, zinc, and mercury anomaly, similar to the anomaly at Manitouwadge, centred on Page Lake.

Recently, drill logs with complete assays, from an exploration program by Kerr Addison Mines Limited in 1971, were added to the Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay. These include results for drillhole KP-71-5 which intersected 18.2 feet of 0.08 ounce gold per ton and 1.16% Zn.

The mineralization encountered occurs as pyrrhotite, sphalerite, and pyrite hosted in felsic volcanic rocks.

Airborne geophysics done by Shell Canada Resources Limited in 1977 shows a number of EM conductors (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

## Pryme Energy Resources Limited - March Resources Limited (McIntyre Cu-Ni Showing)

The property is located 16 km northeast of the junction of the Trans-Canada Highway 17 and the Manitouwadge Highway 614. The area was first staked by C. Von Klein in 1962 and optioned to McIntyre-Porcupine Mines Limited, who performed geophysical surveys (electromagnetic and magnetic), geological mapping, and drilled 28 holes. In 1964, Caravelle Mines Limited gained control of the group and optioned it to Falconbridge Nickel Mines Limited. It was staked by Pryme Energy Resources Limited and March Resources Limited in July 1982, and was then optioned to Noranda Mines Limited.

Exploration of the property defined 6 Cu-Ni and Cu-Zn occurrences on the ground; the most significant is Showing No. 2. Two drillholes cut gold-bearing sulphide mineralization in "andesite". Assays are as follows:

Hole $A_2$ — 8.2 feet, Cu 1.05 %, Zn 0.8 %, Ag 0.40 oz/ton, Au 0.24 oz/ton

Hole $W_1$ — 7.0 feet, Cu 2.94 %, Zn 2.12 %, Pb 0.14 %, Au 0.094 oz/ton, Ag 1.54 oz/ton

(Assays by Falconbridge Nickel Mines Limited *in* 1970, Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

A semi-quantitative spectrographic analysis showed the presence of molybdenum.

A recent drill program was unable to confirm the past results (The Northern Miner, July 21, 1983).

# Summary of Exploration Guidelines—Hemlo Area

## Geological Guides

The Hemlo deposit occurs at the contact between felsic crystal tuffs and metasediments (pelites, calc-silicate, and siltstones). Five felsic piles have been identified thus far at Heron Bay, Moose Lake, Theresa Lake, White River, and Pic River. Most are associated with sediments. Near the Hemlo deposit, the associated crystal tuffs have been altered to sericite, green mica, tourmaline, and hematite. Similar alteration (sericite and green mica) has been reported from properties on the Heron Bay, Moose Lake, and Theresa Lake felsic piles. The significance of pelites in the area of the deposit is not understood but they may represent alteration products.

## Geophysical Guides

Both VLF and Magnetometer methods can be used to trace stratigraphic marker units; the main ore zone did not respond to these methods. Induced Polarization surveys did indicate the presence of the ore zone; however, there are many Induced Polarization responses in the deposit stratigraphy.

## Geochemical Guides

The deposit responds well to both humic gold surveys and "B" soil horizon gold surveys. In humic gold surveys, backgrounds are <10 parts per billion and anomalies are 40 parts per billion; in "B" soil horizons, the backgrounds are <14 parts per billion and the anomalies are up to 430 parts per billion (Quartermain *et al.* 1983). Soil samples done by R. Newman on the Golden Sceptre property (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay) indicate anomalies up to 10 000 parts per billion associated with the Fracture Zone occurrence. Molybdenite in "B" soil horizons also indicates the presence of the deposit.

Further information in geochemical surveys is presented in the section on "Quaternary Geology—Hemlo Area".

# Barite Occurrences in the Hemlo Area

## Introduction

A barite-rich horizon has been identified by Ore Quest Consultants Limited. The western end of the horizon is located 10 km east of Marathon. The baritic unit, which trends 95° and dips 80°S, can be traced by geology and geophysics an additional 6 km east, across properties held by Cal Dynamics Energy Corporation, Kadrey Energy Corporation, Rideau Resources Corporation, Padre Resources Limited, and Northern Eagle Mines Limited.

On a regional scale, the barite-rich horizon occurs at the contact between mafic pillowed metavolcanics to the south and metasediments and felsic metavolcanics to the north. The baritic horizon contains units of massive barite, graphitic schist, green mica schists, carbonate, chert-pyrite, and sericite schist. Geophysically, the horizon is marked by an EM conductor (graphitic schist), Induced Polarization anomalies (pyrite zones), and at the break between high magnetics (mafic volcanics to the south) and low magnetics (metasediments to the north).

The deposits are being examined both for the relationship between gold and barite in the Hemlo deposit and for the potential for industrial barite.

## The Northern Eagle Mines Limited Property

The occurrence is located 1.6 km east of the Black River and 0.5 km north of the Trans-Canada Highway 17. The occurrence has been trenched, exposing a unit of massive barite (1 to 2 m), with a strike of 110°, dipping 80°S for 60 m. The massive barite is pale grey-white in colour with weak bedding due to carbonate and pyrite-rich layers 1 to 2 mm wide that make up <10% of the rock. Gold assays are generally <400 parts per billion gold. The stratigraphy consists of mafic metavolcanics and metasediments to the south followed by a quartz-feldspar sill (3 m wide) with lenses of graphitic schist, followed by the barite unit. This is overlain by a sericitic schist with abundant green mica, graphitic schists, and metasiltstone. Further to the north (1 km), metapelites with garnet, staurolite, and andalusite are exposed.

## The Padre Resources Property

The barite-rich horizon outcrops on the Padre Resources property, approximately 700 m west of the Black River Bridge on Highway 17, and 200 m north of Highway 17. Stripping has revealed a barite horizon, up to 1 m wide. A thin section shows the rock to contain up to 70% barite with minor pyrite, quartz, and carbonate. An assay of this material gave 35.7% BaO, with a specific gravity of 3.5 (Geoscience Laboratories, Ontario Geological Survey, Toronto). All rocks strike at 110° and dip steeply to the south. To the south of the barite-rich horizon are massive mafic metavolcanics intercalated with graphitic interflow metasediments. Approximately 25 m below the barite-rich horizon is a fragmental unit consisting of fragments of mafic metavolcanics and graphitic schist in a biotite-rich matrix. A quartz-feldspar porphyry, with distinctive blue quartz-eyes, intrudes parallel to foliation and is in contact with a biotite-green mica-carbonate schist containing minor fluorite. This rock contains 20% apple green mica. A quantitative spectrographic analysis of the mica indicates more than 0.1 to 0.5% barium, 0.1 to 0.5% chromium, and 0.05 to 0.1% strontium (Geoscience Laboratories, Ontario Geological Survey, Toronto). This is followed by 1 m of the barite-rich rock.

Directly above this unit is a sericite-carbonate schist with up to 15 to 20% pyrite. Assays of this unit returned up to 42 parts per billion gold (Geoscience Laboratories, Ontario Geological Survey, Toronto). To the north of this unit is a siltstone with graded beds indicating tops to the north.

In drill core, a number of cataclastic zones (consisting of wallrock fragments in a fine-grained matrix stained red by hematite) are associated with the barite zone. In thin section, some of the fragments are lamprophyres similar to those associated with the Coldwell Complex (age ≅ 1.04 billion years). Pelitic metasediments which occur to the north of the siltstone contain andalusite, kyanite, sericite, and quartz. The assemblages are indicative of low to mid-amphibolite grade metamorphism.

## Kadrey Energy Corporation and Cal Dynamics Energy Corporation

Stripping has revealed a barite-rich unit near the claim boundary between Kadrey Energy Corporation and Cal Dynamics Energy Corporation. The occurrence is located 2 km east of the Pic River, and 1 km south of Highway 17. The barite-rich unit, 2.8 m wide, striking 85° and dipping 80°S, is associated with graphitic schists and pyrite-carbonate metasediments. The barite unit is light grey-white in colour with minor beds of pyrite-chert-carbonate. In drill core, the massive barite gradually grades into pyrite-rich chert-carbonate. Drilling on a series of Induced Polarization anomalies has intersected 3 parallel barite units up to 3 m wide, associated with sericite-green mica schists on the footwall. To the north of the stripped barite occurrences are siltstone units, with graded bedding indicating tops to the north. In drill core, rip-up clasts rich in green mica occur within some of the siltstone units. The rocks are cut by numerous lamprophyre dikes. The drillholes cut a number of cataclastic breccias. An assay of the baritic sediment returned 45.9% BaO with a specific gravity of 3.8 (Geoscience Laboratories, Ontario Geological Survey, Toronto).

## Origin of Barite Deposits

A brief literature search on barite deposits was made; Brobst (1975) and Morse (1980) provide summaries.

Bedded barite deposits occur in Arkansas, Washington, California, and Nevada. A summary of their geology was reported in Morse (1980):

> *The most important commercial deposits are of bedded barite. The principle locations of these deposits are Arkansas, California and Nevada. The barite in these areas is generally dark gray to black and has a characteristic fetid odor when struck with a hammer. The beds, which vary from several inches to over 500 feet thick, occur interbedded with dark chert and siliceous siltstone and shale. In most of the deposits, the barite is laminated. In some areas, barite nodules and rosettes make up a large part of the beds. Many of the beds contain 50 percent to 95 percent barite.*

The reader is referred to Shawe *et al.* (1969) for further details on the Nevada barite occurrences, to Mills (1971) who describes the deposits in Washington, and to Zimmermann and Amstutz (1964) for deposits in Arkansas. Deposits of bedded barite have also been reported in Yukon Territory (Blusson 1976). These workers suggest a sedimentary origin for the barite, citing the occurrence of fossils, crossbedding, barite clasts in associated conglomerates, and organic matter in the baritic rocks as evidence.

A number of other occurrences of bedded barite are known: in the Archean of Western Australia, the North Pole Deposit, Hickman (1973); South Africa, Fig Tree Group, Heinrichs and Reimer (1977); and Zimbabwe, Bulawayan Group, Morrison (1970). These workers cite similar evidence for a sedimentary origin as those in the United States, namely primary sedimentary bedding, a stratigraphy that can be traced several kilometres, and clasts of barite in conglomerates.

Earlier workers (e.g. Scull 1958) in Arkansas suggested that barite is formed as the result of hydrothermal solutions replacing carbonate. However, most of these occurrences are distal to intrusions that might be a source. Barite at Carlin, Nevada, occurs in 2 fashions, as enrichments in silicified carbonates and as veins (Radtke *et al.* 1980). Both modes of occurrence at Carlin are thought to be replacement of primary carbonate by epithermal solutions.

The barite occurrences at Hemlo appear to be the first Archean occurrences documented in Canada. Barite occurrences south of Timmins, Ontario, appear to be Proterozoic in age (I. Cameron, Research Geologist, Geological Survey of Canada, Ottawa, personal communication, 1983) as are occurrences in the Thunder Bay area.

The Ore Quest Group of occurrences may be sedimentary in origin: they are finely bedded; interfingered with cherts, carbonate, and graphitic schists; they occur in the same stratigraphic position along a strike length of at least 6 km; and rip-up clasts of mica schist, containing a green mica which is associated with the baritic horizon, have been found in siltstones stratigraphically above the baritic horizon.

In comparing the barite at the Goliath deposit to the Ore Quest occurrences, there are differences. The most notable is the degree of recrystallization in the Goliath deposit barite. This has resulted in coarser and occasionally bladed crystals of barite with a whiter colour being produced. Recrystallization has obscured any fine sedimentary textures, which are evident in the Ore Quest occurrences. The general stratigraphy of both occurrences is similar, with the notable absence of crystal tuffs in the Ore Quest occurrence. The presence of a green mica, which appears to be an alteration product, occurs at both locations. The barite in the Goliath deposit tends to be confined to the footwall adjacent to wider sections of the ore zone.

Barite is absent in the Corona East Ore Zone. Some barite occurs as thin (1 cm) beds in the Lac Minerals Limited's deposit. The stratigraphic relations between the Hemlo deposit and the Ore Quest occurrences is unknown.

Research is planned for these deposits by P. Fralick (Lakehead University) and K. Butella (Ore Quest Consultants, Vancouver). Isotopic studies are being done by I. Cameron, Geological Survey of Canada. The quality of the barite is being tested by the Geoscience Laboratories, Ontario Geological Survey, Toronto.

## Hemlo Area Research

In addition to company programs, there are 23 research projects being carried out by various Universities, the Federal Government, and the Ontario Provincial Government.

These projects can be broken down into several groups:

(A) Regional Geology: G.M. Siragusa (Ontario Geological Survey) is continuing regional mapping to the east of Muir's (1982a, 1982b) map areas. M. Ferreira (University of Western Ontario) is doing a regional study of the metamorphic petrology.

(B) Local Geology: T.L. Muir (Ontario Geological Survey) will work on a detailed map from Rous Lake to Highway 614. M. Hugon (University of Toronto) will study the structural geology in the same area. I. Cameron (Geological Survey of Canada) and K. Hattori (University of Ottawa) are carrying out isotope studies on the sulphides and sulphates of the deposit. D. Harris (Geological Survey of Canada) is carrying out studies on the ore mineralogy. Detailed studies of the individual sections of the deposit are also being performed.

1. Williams option (Lac Minerals Limited): Bob Barnett (University of Western Ontario) is doing a Ph.D. thesis on the deposit. Three Bachelor of Science theses are also being done at the University of Western Ontario: P. Newegiowski, Ore Zone Petrology; K. Powell, Hanging Wall Alteration; and P. Trowell, Gold Distribution in the Williams deposit.
2. International Corona Resources Limited Deposit (Teck Corporation): Rod Burke (Queen's University) is doing a M.Sc. thesis on the geology of the International Corona Resources Limited Deposit.
3. Goliath Gold Mines Limited Deposit (Noranda Mines Limited): R. Kuhns is doing a Ph.D. thesis at the University of Minnesota on the geology of the Goliath deposit. T. Hughes (Carleton University) is studying the metamorphic petrology.

(C) Exploration Guidelines:

1. Geochemistry: J.A.C. Fortescue (Ontario Geological Survey) is carrying out soil and humic geochemistry on the Williams deposit (summary in this report). P. Friske (Geological Survey of Canada) is conducting regional lake bottom sediment sampling. R. Goad (University of Western Ontario) is looking at regional geochemistry for Noranda Mines Limited. Ray Bisque (private consultant) is testing an experimental soil-lithogeochemistry system on the International Corona Resources Limited Deposit. R. Kristjansson (Ontario Ministry of Natural Resources, Thunder Bay) and B. Geddes and G. Jones (Ontario Geological Survey) are carrying out Quaternary geology studies.
2. Geophysics: P. Sivenas (University of Toronto) is testing an experimental S.P. (Self Potential) unit on a number of properties in the area.

## Gold Exploration in the Thunder Bay to Atikokan Area

Gold exploration west of Thunder Bay is centred on 2 principal areas: the Atikokan area, and the area around the north shore of the Shebandowan Lakes. Gold occurrences are also known in Gorham Township, north of Thunder Bay, and these are described below.

In the Atikokan area, the most active property appears to be the Fern Elizabeth Gold Mine located north of Modred Lake in the southwestern quarter of Freeborn Township. Extensive stripping and trenching has uncovered numerous quartz veins that are now being actively evaluated. Spectacular samples of native gold are still being found on the property. Additional information is presented in the Atikokan section of the report by Patterson *et al.* (1983).

### Shebandowan Area

Lincoln Resources Incorporated and G.L.E. Limited began a drilling project on the Ray Smith occurrence near Kashabowie, Ontario. The initial drilling program is scheduled for 1500 m in 20 holes. The first 6 holes have been spotted to intersect the structure at a depth of 20 m. Preliminary results are as follows:

| Hole | Dip | Azimuth | Interval | Core Length | Au (oz/T) | Ag (oz/T) |
|---|---|---|---|---|---|---|
| RS-83-01 | 45° | Grid west | 28.94-29.70 | 0.75m | 0.71 | 1.90 |
| | | includes | 29.24-29.70 | 0.46m | 1.08 | 2.85 |

> *Impressive samples of free gold have been found on the property. Lincoln Resources Incorporated also has interests in the Gold Creek area, located approximately 65 km west of Thunder Bay. Mapping has delineated sulphide-rich felsic tuffs with a "favourable" area measuring 1830 m by 550 m. Drilling is contemplated for the late fall or winter.*
>
> (George Cross Newsletter, October 14, 1983).

An interesting gold occurrence was brought to the Resident Geologist staff's attention by Verma Hemeshuhta of R.R. 1, Kaministikwia. The occurrence is situated in Lot 12, Concession B of the Dawson Road Lots. Gold occurs with an arsenopyrite-bearing quartz vein hosted by metavolcanics of intermediate composition. Grab samples collected by Resident Geologist staff were assayed for gold and silver by the Geoscience Laboratories, Ontario Geological Survey, Toronto, with the following results:

| Sample Number | Au (oz/T) | Ag (oz/T) |
|---|---|---|
| NCR-107-83 | 0.35 | 0.10 |
| NCR-108-83 | 0.40 | 0.18 |
| F-167-80* | 0.60 | N.D. |
| F-168-80* | 0.58 | N.D. |
| 3240 | 0.44 | 0.10 |

Six other samples ranged from trace to 0.06 ounce gold per ton. Samples F-167-80* and F-168-80* were submitted by Mr. Herneshuhta.

The vein is <30 cm wide at its widest point with an average apparent width of about 15 to 20 cm. The wallrock adjacent to the quartz vein is mineralized with disseminated pyrite. At the contact between the quartz and the wallrock, the vein is mineralized with arsenopyrite. Gold is probably associated with the arsenopyrite-rich sections. Limited manual trenching is the only work done on the prospect. The area has never been mapped by any government agency at any detailed scale. T.L. Tanton mapped the area on a regional scale for the Geological Survey of Canada in the 1920s but did not mention the occurrence. Gold has also been reported from Mining Locations T 163 and T 211, both in Ware Township (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

A preconception about the difficulty of assembling parcels of private land for the purpose of mineral exploration has deterred exploration by the mining companies, even though the mineral potential of the area is very high for gold and base metals.

A wide (up to 6 km) felsic volcanic unit that strikes from the Kaministikwia River eastward to Thunder Bay has been described by Kustra (1973). This unit, together with the adjacent mafic volcanic rock assemblages should be the focal point for exploration for base metals and gold in the Thunder Bay area. Analysis of a sulphide showing on Highway 102 near Mud Lake gave the following results: 0.87% zinc, 0.27% copper, 0.005 ounce gold per ton, and 0.12 ounce silver per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

Kustra (1973) describes the unit as a steeply or vertical dipping assemblage of felsic to intermediate flows, quartz-feldspar porphyry, tuffs, volcanic breccia, and interrelated mafic volcanic rocks. Generally, the rocks are massive to moderately sheared, variably sericitized, and slightly to moderately carbonatized. The more massive varieties are hard, blocky, and brittle; fracturing conchoidally with razor sharp edges. A white chalky weathered surface is common; the fresh surface varies in colour from grey, to apple green, to black. A sample of black quartz-eye rhyolite, adjacent to the mineralized zone on Highway 102 opposite Mud Lake, was submitted for whole rock analysis with the following results:

|  | Percent |  | Percent |  | ppm |
|---|---|---|---|---|---|
| $SiO_2$ | 75.6 | $TiO_2$ | 0.40 | Ba | 300 |
| $Al_2O_3$ | 12.0 | $P_2O_5$ | 0.05 | Co | 5 |
| $Fe_2O_3$ | 0.37 | MnO | 0.05 | Cr | 8 |
| FeO | 1.54 | $CO_2$ | 1.69 | Cu | 44 |
| MgO | 0.51 | S | 0.15 | Li | 18 |
| CaO | 2.11 | $H_2O$ | 0.07 | Ni | < 5 |
| $Na_2O$ | 2.26 | $H_2O+$ | 1.35 | Pb | < 10 |
| $K_2O$ | 1.75 | LoI | 3.0 | Zn | 32 |

## Gorham Township

Central Gorham Township has very good potential for gold. The area has been mapped by Macdonald (1939) and portions by Moorehouse (1960).

Three well documented gold occurrences are located in the south central portion of Gorham Township. These occurrences lie more or less on strike and are known, from west to east, as the Thunderhead Gold Mines property, the Lakehead Gold Mine property, and the Gorham Gold Mines property. The area has been described by Macdonald (1939) as being underlain by felsic volcanic tuffs, and agglomerates with interrelated andesitic flows. The tuffs are carbonatized and most rock units are sheared. Cherty oxide ironstones occur throughout the succession.

At the Lakehead Gold Mines property, mineralization associated with the quartz veins consist of disseminated pyrite, chalcopyrite, and visible gold. The wallrock is pyritized up to 3 feet along one side of the quartz vein. Sampling of the vein, by W.W. Beaton, indicated an average of 0.6 ounce gold per ton over 27 inches for a length of 124 feet (Macdonald 1939). A summary of assays done by the Resident Geologist's Office is presented in Table 5.

The following is extracted from Macdonald (1939):

> *At the Gorham Gold Mines property the main vein is situated in a sheared carbonated tuff. It has been traced for approximately 325 feet and averages 3½ feet wide for 280 feet. Diamond drilling has indicated that this width persists at least a depth of 300 feet. Mineralization consists of pyrite, chalcopyrite and gold. J.D. Wright states that surface sampling showed an average assay of 0.32 ounces gold per ton for a width of 3½ feet over a strike length of 280 feet. An adit has been driven into the vein for 86 feet where the vein averaged 4.8 feet wide with assays averaging 0.26 ounces gold per ton.*

TABLE 5 | GOLD ASSAYS – GORHAM TOWNSHIP AREA

| Sample Number | Au (oz/T) | Ag (oz/T) | Remarks |
|---|---|---|---|
| Lake Head Gold Mines Ltd. | | | |
| F-35-77 | 1.32 | 0.12 | #1 vein, 2' chip sample |
| F-36-77 | 0.48 | 0.20 | #2 vein |
| F-229-79 | 0.01 | Trace | chlorite schist, host rock |
| F-230-79 | 2.04 | 0.17 | #1 vein, 3.3' chip sample |
| F-113-82 | 0.70 | Trace | quartz vein |
| F-114-82 | 0.30 | - | quartz vein |
| F-115-82 | 0.03 | Trace | host rock |
| F-116-82 | 0.25 | Trace | #2 vein, host rock |
| Thunderhead Gold Mines | | | |
| F-231-79 | 0.29 | 0.10 | grab sample |
| F-232-79 | 0.08 | Trace | 1.1' chip sample |
| F-233-79 | 0.01 | Trace | 9" chip sample |
| F-234-79 | Trace | Trace | 3.5' chip sample |
| F-235-79 | Trace | 0.36 | 3' chip sample |

The reader is referred to Macdonald (1939) as well as the Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay, for more detail on the Lakehead Gold Mines property, the Thunderhead Gold Mine property, and the Gorham Gold Mines property.

# Beardmore-Geraldton Economic Geologist Program

## Introduction

The Beardmore-Geraldton Economic Geologist Program (Figure 4) is a community based Northern Ontario Rural Development Agreement (NORDA) program funded jointly by the Ontario Ministry of Northern Affairs and the Federal Department of Regional Economic Expansion. The program, in its third year, is staffed by John Mason and Gerry White. The object of the program is to stimulate exploration by assisting prospectors and mining companies in the Beardmore-Geraldton area, with property visits (31 in 1983), mapping, sampling, literature searches, leading field trips to "orient" new companies and other researchers in the area, and documenting all mineral occurrences.

## Producing Gold Mines and Major Exploration Programs

Two gold deposits in the Beardmore-Geraldton area were in production during 1983. Mining Corporation of Canada Limited is mining and milling the Consolidated Louanna Gold Mine orebody at O'Sullivan Lake. Thyssen Mining Construction of Canada Limited, representing numbered Ontario Company 530260, is mining (bulk sampling) the Brenbar Gold Mine, Irwin Township, for treatment at the Pamour Mill, Timmins. As of November 15, 1983, 800 to 850 tons of gold ore were shipped (Hugh Boyle, Mining Engineer, Thyssen Mining Construction of Canada Limited, personal communication, 1983).

Teck Corporation, owner of the Leitch Gold Mine, has leased the Pancontinental Mining (Canada) Limited Custom Gold Mill, Beardmore, for 3 years, 7 months effective November 1, 1983. The mill will be modified to a total cyanide circuit compatible with Leitch ore (waste dump). (B. Fenoulhet, Policy Analyst, Mineral Resources Branch, personal communication, 1983). Hand-sorting of vein material was employed at the Leitch Mine throughout production (1936 to 1968) of 847 690 ounces of gold at a grade of 0.92 ounce gold per ton. The mill will continue to provide custom gold milling service through the GOMILL Program of the Ontario Government.

Roxmark Mines and Sherritt-Gordon Mines Limited are re-evaluating the Magnet Consolidated Gold Mine, Errington Township, through a program of dewatering, diamond drilling, sampling, and mapping. A headframe, hoist, warehouse, and office have been installed on site.

Phoenix Gold Mines Limited has initiated a feasibility study for possible exploration and development on the Quebec Sturgeon River Gold Mine.

Metalore Resources is conducting a 4-stage, 6000-metre diamond drill program on the Brookbank gold prospect, Irwin Township. Dome Exploration (Canada) Limited have commenced a 3900-metre drill program on the Jellicoe Mine property, Lindsley Township.

Other exploration programs within the Beardmore-Geraldton area have been summarized in Table 6.

## General Geology and Structure

The Beardmore-Geralton area lies at the southern boundary of the east-trending, isoclinally folded Early Precambrian metavolcanic-metasedimentary sequence of the Wabigoon Subprovince. It is not clear whether lithological contacts in the Beardmore-Geraldton area represent depositional facies changes or are tectonically transposed, as has been demonstrated elsewhere in the Wabigoon Subprovince (Poulsen 1981). All lithofacies reconstructions are therefore, necessarily, conjectural. A unit of fine-grained metasediments (wacke, siltstone, argillite) bounded on the south by a laterally extensive mafic to intermediate metavolcanic unit (basalt, mafic tuff) appears to be disconformably overlain by a coarser grained metasedimentary unit (conglomerate, wacke, argillite,

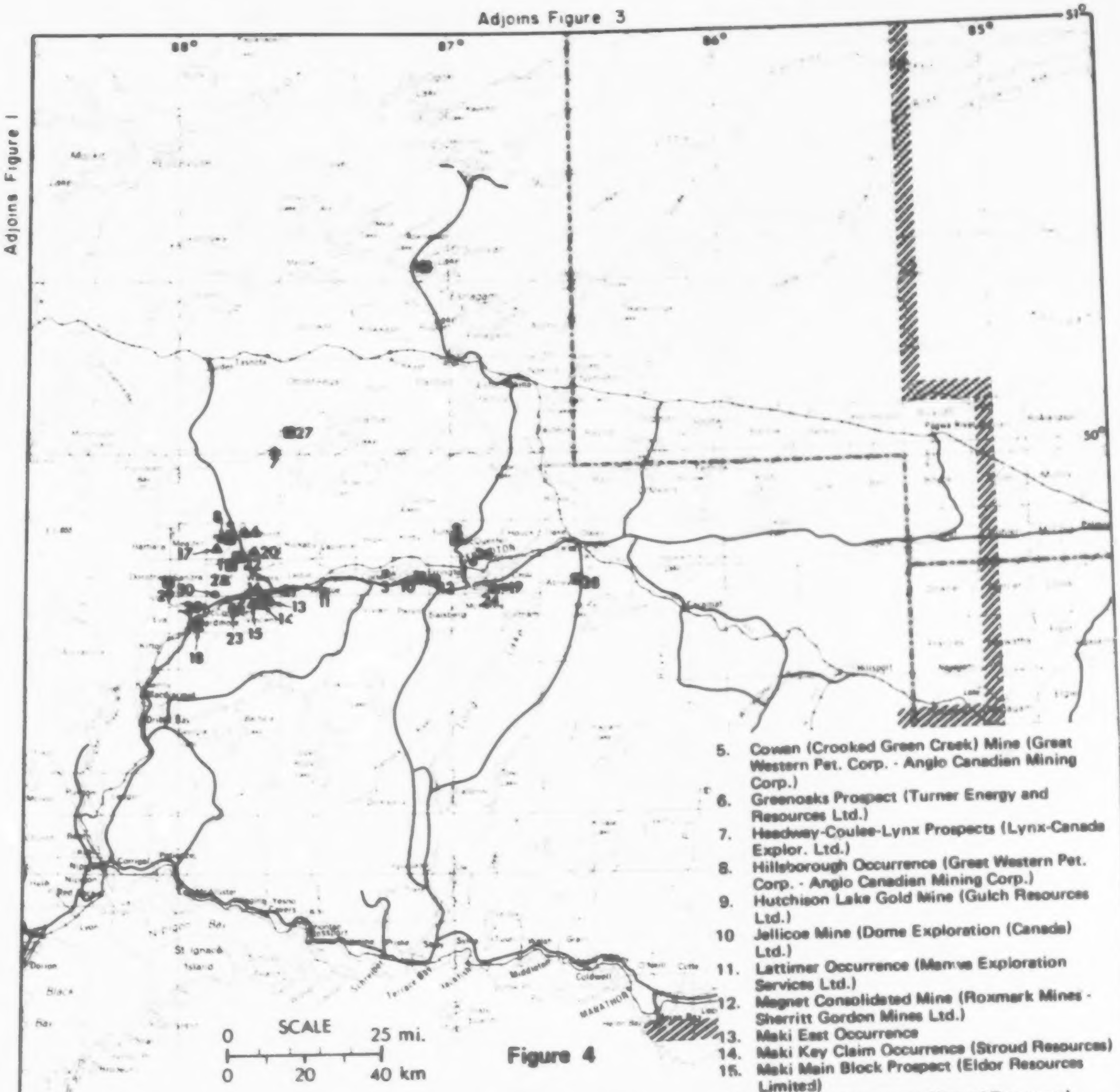


Figure 4

■ **MINE** (including past producers) with a minimum production of not less than 100 ounces of gold

▲ **PROSPECT** with significant development work usually consisting of one or more of the following:

(a) Production of less than 100 ounces of gold;
(b) Over 100 feet of underground lateral development work;
(c) Over 600 metres (2000 feet) of diamond drilling

● **OCCURRENCE** - Little development work carried out

**PROPERTY VISITS, 1983: Beardmore-Geraldton Economic Geologist Program**

1. Brenbar Mine (530260) Ontario Ltd.)
2. Brookbank Prospect (Metalore Resources Ltd.)
3. Colter Twp. Claims (COMINCO)
4. Consolidated Louanna Gold Mine (Mining Corp. of Can. Ltd.)
5. Cowan (Crooked Green Creek) Mine (Great Western Pet. Corp. - Anglo Canadian Mining Corp.)
6. Greenoaks Prospect (Turner Energy and Resources Ltd.)
7. Headway-Coulee-Lynx Prospects (Lynx-Canada Explor. Ltd.)
8. Hillsborough Occurrence (Great Western Pet. Corp. - Anglo Canadian Mining Corp.)
9. Hutchison Lake Gold Mine (Gulch Resources Ltd.)
10 Jellicoe Mine (Dome Exploration (Canada) Ltd.)
11. Lattimer Occurrence (Manwa Exploration Services Ltd.)
12. Magnet Consolidated Mine (Roxmark Mines - Sherritt Gordon Mines Ltd.)
13. Maki East Occurrence
14. Maki Key Claim Occurrence (Stroud Resources)
15. Maki Main Block Prospect (Eldor Resources Limited)
16. Maki West Occurrence (Stroud Resources)
17. Maloney-Sturgeon Prospect (Manwa Exploration Services Ltd.)
18. McWilliams-Beardmore Prospect (D. Thorsteinson)
19. Mineral Lake Occurrences (J. Forbes - O. Theriault)
20. Mitto Prospect (Kengate Resources Ltd.)
21. Pichette Prospect (Canamax)
22. Quebec-Sturgeon River Gold Mine (Phoenix Gold Mines Ltd.)
23. Ralph Lake Occurrences (J. Ternowesky - P. Skalesky)
24. Roche Long Lac Prospect (Cambridge Resources)
25. Spooner Prospect (Pancontinental Mining (Canada) Ltd.)
26. Swereda Occurrence
27. Tashota-Nipigon Mine (Lynx-Canada Explor. Ltd.)
28. Theresa Gold Mine (Cotton Valley Resources)
29. Tyson Gold Mine (Stroud Resources)
30. Watson Lake Occurrence (Bema Industries Ltd.)

ironstone) in the Geraldton area (Mackasey 1970a; Pye 1951). Both metasedimentary units thin to the north, and are overlain by a mafic to intermediate unit in an area north of Beardmore (Mackasey 1975). Further north and up-section in the Paint Lake area, felsic pyroclastic rocks interfinger with coarse clastic metasediments (Mackasey 1970a). The metavolcanic-metasedimentary sequence has been intruded by felsic batholiths, stocks and sills, and lenticular mafic intrusions. Late Precambrian diabase dikes and sills intrude all rock types. The regional metamorphic grade is greenschist facies.

Folding has been about east-trending axes at Beardmore and Geraldton. Ironstone, spatially related to many gold deposits in the Beardmore-Geraldton area, can be traced in outcrop and from aeromagnetic data from southwest of Lake Nipigon to east of Geraldton. The ironstone is situated at the northern boundary of the most southerly metasedimentary unit (coarse metasedimentary unit). Regional or east-trending faults, i.e. Paint Lake Fault, can mark changes in lithology or structural style. "South of the fault, interbedded metasediments and mafic-metavolcanic flows are folded along east-trending axes, but to the north, intermediate to felsic pyroclastic rocks predominate and fold axes trend north and northwest" (Mackasey 1970a, p.74).

The Bankfield-Tombill Fault (strike 100° to 110°, dip 60° to 70°S) and the east-trending Little Long Lac Fault appear to have been important in determining the location of most of the Geraldton area gold deposits. Motion on the faults is complex. Underground mapping by Pye (1951, p.42-45) indicates that thrusting to the north is dominant with minor rotational and translational adjustments. Faulting commenced prior to mineralization but subsequent to felsic intrusion and continued after mineralization (Mason and McConnell 1983).

TABLE 6 | 1983 EXPLORATION PROGRAMS IN THE BEARDMORE-GERALDTON AREA

| Company | Township/Area | Exploration |
|---|---|---|
| Bemo Industries | Irwin Township | Surface, sampling |
| Cambridge Resources | Errington Township | Geology |
| Canamax | Klotz Lake | Geology |
| Canamax | Vincent Township | Geology, D.D.H. |
| Cominco Ltd. | Colter-Lindsley Townships | Overburden drilling |
| Eldor Resources Limited | Vincent Township | Geology, D.D.H. Geophysics |
| Exchange Mining | Klotz Lake | Linecutting |
| Explorations Banque-or Incorporated | Klotz Lake | D.D.H. |
| Great Western Petroleum Corporation | Pifher Township | Geology, D.D.H., Trenching |
| Hill, Goettler, Delaporte | Elmhirst-Rickaby Townships | Geophysics, D.D.H. |
| Holmwood Resources | Meader-Sandra Townships | Surface |
| Kengate Resources Incorporated | Elmhirst Township | D.D.H. |
| Kerr Addison Mines Limited | Melchett-Briarcliffe Lakes | Geology |
| Kerr Addison Mines Limited | Melchett-Briarcliffe Lakes | Geology |
| Kerr Addison Mines Limited | Onaman Lake | Geology |
| Kerr Addison Mines Limited | Jellicoe | Geology |
| Kerr Addison Mines Limited | Toronto Lake | Geology |
| Lacana Mining Corporation | O'Sullivan Lake | Geology |
| Lacana Mining Corporation | Humboldt Bay | Linecutting, Geophysics, Overburden Sampling, D.D.H. |
| Manwa Explorations | Legault Township | Geology |
| Manwa Explorations | Pifher Township | Geology |
| Noranda Exploration Company Limited | Willet Lake | Geology |
| Odessa Exploration Incorporated | O'Sullivan Lake | Sampling, D.D.H. |
| Pancontinental Mining (Canada) Limited | Summers Township | D.D.H. |
| Stroud Resources Limited | Dorothea Township | Trenching, Geology, Sampling |
| Stroud Resources Limited | Vincent-McComber Townships | Trenching, Geology, Sampling |
| The Quaternary Mining and Exploration Company Limited | Geraldton to Long Lake | Linecutting, Stripping |
| Turner Energy and Resources Limited | Pifher Township | D.D.H., Geology, Stripping |
| Villeneuve Exploration | Klotz Lake | D.D.H. |

# Gold Mineralization

Production from the Beardmore-Geraldton area has exceeded 4.1 million ounces of gold and 250 000 ounces of silver. Gold mineralization has been subdivided into "belts" on the basis of stratigraphic location and host rock lithology.

## (1) Southern Mafic Metavolcanic Belt

The most southerly unit in the Wabigoon Subprovince is an intermediate to mafic metavolcanic sequence, forming an east-trending lenticular belt up to 3 km wide. It consists of massive, pillowed, and amygdaloidal flows (chlorite schist), mafic tuffs, felsic to mafic intrusions, and/or coarse flow rocks. Mapping by Carter (1983) has outlined a major anticline with overturned limbs in Vincent-McComber Townships. The south metasedimentary unit overlies the south metavolcanic unit; although the contact may be structural. Chemical metasediments (chert and ironstone) and post-ironstone quartz (± carbonate) veins are hosted by the metavolcanics. The ironstone units are east-trending, steeply dipping regional features, occurring as discontinuous lenses. They are magnetite-silicate-carbonate ironstones consisting of alternating ferruginous recrystallized chert, magnetite, iron carbonate, and iron amphibole (grunerite) members. Fracturing has allowed vein quartz to be injected with arsenopyrite, pyrrhotite, magnetite, chalcopyrite, and gold. The quartz (± carbonate) veining has intruded the mafic metavolcanics disconformably to foliation. Gold is associated with chalcopyrite, galena, and pyrrhotite.

Examples include: the Northern Empire Mine, the Maki property, and Craskie-Vega prospects (Patterson *et al.* 1983). Descriptions of the Ralph Lake, Lattimer, McWilliams-Beardmore, and Spooner-Norex occurrences follow.

## Ralph Lake Occurrence (Delbridge, Dominion, Blacksmith Occurrences)

The Ralph Lake occurrence is located in central McComber Township between the north and south parts of the Blackwater River, approximately 9 km east-northeast of Beardmore, Ontario. Diamond drilling, geochemistry, and surface work have been undertaken by previous owners. Detailed mapping and sampling were undertaken in 1983 by current owners, Tenacity Mines.

The gold occurrence outcrops within a sequence of mafic to intermediate metavolcanics, typically massive, pillowed, or tuffaceous, and rarely variolitic. Chemical metasediments (ironstone and/or chert) are intruded by vitreous conformable quartz veins. The chemical metasediments are east-trending to 70° and steeply dipping. Three main zones comprise the Ralph Lake occurrence: the Delbridge, Blacksmith, and Dominion occurrences.

The Delbridge occurrence northeast of Ralph Lake occurs in a massive to recrystallized chert ± magnetite ironstone, hosted in sheared metavolcanics. The unit can be traced 120 m and averages 2 m wide. The chert is well fractured, and laminated with sulphides, magnetite, chlorite, and tourmaline. Gold is associated with subhedral to euhedral coarse arsenopyrite and minor pyrite. A vitreous quartz vein intrudes the chert parallel to bedding.

The Blacksmith occurrence at Ralph Lake is hosted in a band of recrystallized chert-magnetite ironstone that can be traced 100 m and is up to 3 m wide. A post ironstone quartz vein 0.35 m wide intrudes the ironstone. Gold is associated with arsenopyrite.

The Dominion occurrence, more poorly exposed than the Delbridge and Blacksmith is hosted in mafic metavolcanics. It can be traced approximately 150 m and is up to 1 m wide. Ironstone is typically made up of recrystallized chert; minor magnetite and carbonate occur within a shear zone. The shear contains arsenopyrite, and has been intruded by a vitreous quartz vein with minor pyrite.

## Lattimer Occurrence

The Lattimer occurrence, Legault Township, is situated 5.5 km east-southeast of Jellicoe, Ontario. The property is held by Manwa Exploration Services who initiated linecutting and detailed geological mapping in 1983. The original gold showing was discovered and drilled by C. Lattimer in 1949 who intersected 0.5 m of 8.16 ounces gold per ton in quartz-carbonate veining hosted by ironstone (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Several ironstone units with a minimum 2.1-metre width are hosted by amygdaloidal to pillowed mafic volcanic rocks, volcanic breccia, coarse-grained flows, lapilli-tuff, and tuff-breccia (Mackasey *et al.* 1976). Recrystallized chert, magnetite, and grunerite are the 3 components of the banded iron formation. Fine veinlets of magnetite occur within the chert and are discordant to bedding. Coarse-grained magnetite beds contain coarse anhedral pyrite that is associated with gold mineralization.

## McWilliams-Beardmore Prospect

The main showing at the McWilliams-Beardmore gold prospect is situated on claim TB 730947 in Summers Township, 2.5 km due east of the town of Beardmore. It immediately joins the Northern Empire Mine ground to the south.

The property was originally staked in 1925, but little development work was done until 1935. Extensive surface exploration was carried out at this time including 1600 pounds (727 kg) of bulk sampling from a series of pits and trenches. Much of the work was concentrated on the main No. 13 vein. This was followed up by 4152.9 m of diamond drilling along a 152-metre length of the showing. In 1973, Gold Ridge Mine Limited acquired a large claim block covering the area. A detailed magnetometer, soil geochemical survey, and diamond drill program were conducted. The main showing was restaked in 1980 by current owner, D. Thorsteinson, and some surface stripping was completed (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

The property is underlain by intermediate metavolcanics (Mackasey 1970b), which are highly sheared and silicified in the vicinity of the main vein (No. 13). The shear zone is conformable with the surrounding rocks, averages 4.6 to 6.1 m in width, and has been traced for 152 m along an east-west strike (266° azimuth). It is described as a highly banded cherty iron formation characterized by 2 generations of quartz. Gold mineralization is predominantly associated with the earlier cherty to rusty, sugary quartz stringers which follow the shear. Later veins of massive to vitreous quartz occupying irregular cross fractures are barren. Pyrite, pyrrhotite, and chalcopyrite make up 2 to 3%. Assays of 0.23 ounce gold per ton were obtained in selected grab samples from dump material along the No. 13 vein (Carter 1973).

### Spooner-Norex Prospect

The Spooner-Norex prospect, Summers Township, lies 3.2 km northeast of Beardmore. Four claims (TB 4812, 4815, 506598, 510708) covering the main showings are under option to Pancontinental Mining (Canada) Limited.

From 1925, when 9 claims were staked, until 1939, a considerable amount of trenching and stripping were completed. Much of the work was concentrated along the "Power vein", a continuation of the main production vein at the Northern Empire Mine. Spooner Gold Mines Limited was incorporated in 1935 and sank 2 shafts, one to a depth of 12 m (40 feet), and an 80° incline driven to a depth of 91 m (303 feet) in 1936. Over 450 m (1500 feet) of crosscuts and drifting were completed when underground operations ceased in 1941.

The property lies entirely within the narrow northeasterly trending belt of Archean metavolcanics bounded north and south by metasediments (wacke). The metavolcanics consist of mafic to intermediate flow rocks with some pillowed units. Three main vein structures are known to exist in the area - the "Contact", "A", and "Power" veins. The Power vein strikes at 80° and is generally conformable to the surrounding highly schistose bedrock, and averages up to 1.5 m in width. It has been traced for over 450 m along strike. Rusty, sugary to granular textured quartz is crosscut by numerous more vitreous quartz stringers. Mineralization is characterized by well defined stringers of pyrite and chalcopyrite parallel to the siliceous banding in the vein, with lesser amounts of arsenopyrite, chalcopyrite, and tourmaline.

Assays of grab samples collected along a 150-metre length of the Power vein range up to 0.18 ounce gold per ton (Geoscience Laboratories, Ontario Geological Survey, Toronto).

## (2)Southern Metasedimentary Belt

A total of 11 gold mines of this deposit type have recorded production. Gold mineralization is associated with the east-trending metasedimentary unit which includes conglomerate, wacke, argillite, and magnetite-hematite chert (± jasper) ironstone. Gold mineralization occurs in shear zones, quartz veins, and breccia zones hosted in clastic metasediments, felsic intrusions, gabbro intrusions, sulphides within oxide ironstone, and minor mafic metavolcanics.

Isoclinal folding and tight drag folding in the Beardmore (Leitch and Sand River Mines) and Geraldton areas, specifically observable in the ironstone, appear to be necessary controls for ore structure developments. Drag folds and ore-bearing structures throughout the belt plunge westward at 35° to 40°. In the Geraldton camp, most gold production has come from the rocks adjacent to, and north of, the Bankfield-Tombill Fault, situated on the south limb of the Little Long Lac Syncline, south of the Little Long Lac Fault-Portage Shear Zone. The Bankfield-Tombill Fault may be the resultant structure after "the limit of drag folding had been reached" (Horwood and Pye 1951, p.29). The 70-kilometre distance between the Beardmore and Geraldton camps, is marked predominantely by a linear ironstone within the metasedimentary package, which has supported no gold production.

Of the gold produced in Beardmore-Geraldton camp, 94% is from the southern sedimentary dominated belt (Mason and McConnell 1983). The deposits in this subdivision have been further subdivided for clarity into 4 types based upon host rock lithology (modified from Pye 1951; Horwood and Pye 1951). It should be noted that individual deposits may exhibit one or more types of mineralization:

(A) Metasedimentary host rock

i) quartz veins and stringers in fracture zones in clastic metasediments — Little Long Lac, Magnet Consolidated, Leitch, Sand River, Hard Rock, Jellicoe, and Talmora Mines;

ii) quartz vein stringers and replacement sulphide zones in ironstone (chemical metasediment with limited clastic component)—MacLeod-Cockshutt-Hard Rock Mines and Solomon's Pillars prospect.

(B) Felsic and mafic intrusive host rocks

i) quartz veins and stringers in folded albite porphyry—MacLeod-Cockshutt-Hard Rock Mines, Roche Long Lac Gold Mine

ii) mineralized zones of shearing and brecciation in albite porphyry—Consolidated Mosher Mine

iii) quartz veins in shear zones in diorite or gabbro—Talmora Mine

(C) Localized at the contact between minor felsic intrusive rocks and metasediments or diorite

i) shear zone containing quartz stringers or sulphides are between metawacke and albite porphyry —Bankfield, MacLeod-Cockshutt-Hard Rock, and Consolidated Mosher Mines

ii) sulphide zones in fracture or shear zones at the contact between ironstone and quartz diorite—MacLeod-Cockshutt Mine

iii) quartz veins at contact between hornblende diorite or gabbro and albite porphyry—Roche Long Lac Gold Mine

(D) Mafic metavolcanic host rock

i) veins cutting mafic metavolcanic—Wods Mac prospect

### Magnet Consolidated Mine

The Magnet Consolidated Mine is located in Errington Township, 8 km west of Geraldton. Production (1938 to 1943, 1946 to 1952) totalled 152 089 ounces of gold at a grade of 0.42 ounce gold per ton (Ferguson *et al.* 1971).

Sherritt-Gordon Mines Limited and Roxmark Mines Limited are joint venture partners conducting an exploration program of dewatering of the underground workings, surface and underground diamond drilling, sampling, and mapping. An independant report completed for Roxmark

Mines Limited has outlined 1 447 000 tons of possible mineralization with an average grade of 0.17 ounce gold per ton (The Northern Miner, September 29, 1983). Past production on the Magnet Consolidated Mine has been from only 2 of 5 known veins.

The property is underlain by conglomerate, wacke, argillite, and ironstone intruded by diorite, diorite porphyry, albite porphyry, and diabase (Pye 1951, p.101). The ironstone is typically composed of magnetite and hematite layers interbedded with argillite (chloritic mudstone) or greywacke. Bedding strikes 110° and dips 75° to 80°S. The unit is on the south limb of the Ellis Syncline (Pye 1951, p.103). Z-shaped folds plunging 30° to 45° west are overprinted on the fold. The Magnet Vein, the main production vein, and other auriferous quartz veins are parallel to the Bankfield-Tombill Fault Zone (105°). The fault zone is a silicified and carbonatized zone up to 30 m wide and traverses the property 345 m south of the shaft. The initial rupture along the fault zone occurred previous to the formation of the orebodies, since at the Magnet Mine, the minor folds are cut by the ore-bearing structures (Pye 1951, p.44).

The Magnet Vein is a persistent composite vein with 1 main vein up to 0.3 m wide. Parallel quartz stringers give the composite vein a maximum width of 4.5 m. The near vertical Magnet Vein exhibits roll structures and intersects the ironstone at 5° to 10°.

Carbonate, pyrite, arsenopyrite, chalcopyrite, sphalerite, galena, and gold occur in the vein. Gold is present as blebs and fracture fillings in pyrite and arsenopyrite, as irregular grains within a grey quartz, and as a fracture filling along contacts between quartz and the host rock (within the crack-seal vein texture). Later stage quartz and calcite veining contains gold along cleavage planes (Pye 1951). Wallrock alteration adjacent to veins typically exhibits sericitization, carbonatization, and silicification within the wacke; and chloritization in the ironstone.

### Roche Long Lac Gold Mine

The Roche Long Lac Gold Mine property is located in Ashmore Township, northeast of Eldee Lake. It consists of approxiately 40 claims and is currently held by Bridgewest Development Corporation (formerly Cambridge Resources) who initiated geological mapping in 1983.

Development work began in 1934 on 16 claims covering 2 mineralized vein structures known as the Blacksmith and Daley veins. A 1-compartment shaft was sunk on the Daley vein to a depth of 34.5 m (115 feet) with no lateral development. During the late 1940s, a variety of surface exploration work was completed over the property which included the Cash Group along the east shore of Eldee Lake. Hollinger Mines Limited optioned the claims from 1970 to 1975 and conducted 745 m (2483 feet) of drilling over selected geophysical anomalies. The ground was held by A. Wilson in 1979, at which time some trenching and minor stripping was done over the vein structures (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay).

Horwood and Pye (1951) indicate the property is underlain by mafic metavolcanics intruded locally by dikes of massive, coarse-grained hornblende diorite to gabbro and albite porphyry. Gold mineralization occurs in veins along 2 parallel fracture zones with an approximate strike of 75° and dipping steeply to the southeast. These zones generally consist of parallel quartz-ankerite veins and stringers up to a metre wide forming sharp contacts with the wallrocks. The Daley vein is the most persistent and can be traced for a distance of 457 m. To the south, the narrower Blacksmith vein is exposed for 76 m; and both structures are open along strike. Sulphide mineralization (pyrite, arsenopyrite, sphalerite, chalcopyrite, and galena) is contained within white massive to sugary textured quartz. Gold occurs as irregular fracture fillings in both the quartz and pyrite, and as tiny replacement blebs in pyrite and arsenopyrite.

Grab samples, collected by J. Scott in 1979 and G. White in 1983, at intervals along the strike of the veins, range up to 1.96 ounces gold per ton and 0.74 ounce silver per ton. Selected samples from the mine dump gave only trace values (Geoscience Laboratories, Ontario Geological Survey, Toronto).

## (3)Northern Felsic Metavolcanic Belt

The stock-related, metavolcanic-hosted gold deposit type is typically of high grade and low tonnage. The deposits are auriferous quartz (± carbonate) veins and fracture-filled sulphide-associated gold deposits in mafic to felsic metavolcanics, often marginal to felsic intrusive stocks. Veins are sigmoidal or lenticular products of ductile failure. Three principal stocks occur in the west-central portion of the belt: The Coyle Lake Stock, The Elmhirst Lake Stock, and the Kaby Lake Stock. Most of the veins that were mined are hosted in the metavolcanics around the intrusions and include the Quebec Sturgeon River Mine and the Orphan (Dik-Dik) Mine. Few gold occurrences have been located within the stocks. Wolfe (1971) noted no anomalous gold concentrations within the Coyle Lake Stock, where a detailed geochemical survey was undertaken (Mackasey and Wallace 1978, p.50).

Examples of deposits in this type of geological setting include the Quebec Sturgeon River Gold Mine, the Consolidated Louanna Gold Mine, the Orphan (Dik-Dik) Mine, the Tyson Mine, the Cowan Mine, and the Mitto and Greenoaks prospects.

### Quebec Sturgeon River Gold Mine

Phoenix Gold Mines Limited is conducting a feasibility study to re-open the Quebec Sturgeon River Gold Mine. Plans are 3-fold: (1) construct a powerline to the mine site; (2) dewater the shaft and; (3) diamond drill from underground. Estimated reserves are 102 285 tons averaging 0.324 ounce gold per ton over 2.6 feet (Quebec Sturgeon River Mine Limited, 1979 Annual Report, p.19).

The Quebec Sturgeon River Gold Mine, located in Irwin Township, 18 km northwest of Jellicoe, produced 72 438 ounces gold and 15 922 ounces silver at a grade of 0.51 ounce gold per ton and 0.11 ounce silver per ton between 1936 and 1942 (Ferguson *et al.* 1971). The mine is the largest producer of the "stock-related" type.

The geology has been described by Mackasey (1975, p.62).

### Tyson Gold Mine

The Tyson Mine is located north of Beardmore in Dorothea Township. In 1983, Stroud Resources conducted a program of power stripping, trenching, detailed mapping, and sampling on the No. 1, 1A, 2, 3, and 7 veins.

The No. 7 vein lies within a sheared quartz-carbonate-graphite zone, hosted in diorite. The degree of alteration of the diorite is directly proportional to the proximity of the shear zone.

The geology of the No. 1 (1A) and No. 3 veins has been described in McIlwaine *et al.* (1982, p.62).

### Cowan (Crooked Green Creek) Mine

The Cowan Mine property is situated in Pifher Tonwship, 24 km northeast of Beardmore. Great Western Petroleum Corporation and Anglo Canadian Mining Corporation are joint venture partners in an exploration program on the Cowan property and adjacent Hillsborough Exploration Limited occurrence. To date, a program of detailed sampling, magnetometer surveys, and diamond drilling has been completed.

The property is underlain by andesite, diorite, rhyolite, rhyolite breccia, related feldspar porphyry, and diabase. Three known auriferous zones have been worked intermittently in the past. The No. 1 vein (zone) has been mined on a seasonal basis by the property vendors, B. & S. Cowan. Gold, chalcopyrite, and pyrrhotite occur in a massive blue-black quartz vein in the No. 1 and No. 2 zones. Drilling on the No. 1 zone over a strike length of 75 m indicates a weighted average grade of 0.7 ounce gold per ton over an average core length of 0.54 m (George Cross Newsletter Limited, Number 153, 1983, p.2). Values grading up to 1.637 ounces gold per ton over a core length of 0.9 m have been intersected in drill core in the No. 2 zone. Two sets of veins, one flat lying and one vertical are of the same generation of quartz and are mineralized with visible gold.

Northern Concentrators' Mill, Thunder Bay, is milling 400 tons of gold ore from the No. 2 zone.

### Consolidated Louanna Gold Mine (Cumo Resources Limited)

The Consolidated Louanna gold deposit at O'Sullivan Lake is being developed, mined, and milled by Mining Corporation of Canada Limited. The north and south veins host a published deposit reserve of 113 129 tons grading 0.352 ounce gold per ton (Carter 1979).

Mining has commenced on various raises and stopes. The decline has been extended 45 m (150 feet) below the third (300-foot) level. Diamond drilling is continuing, with 11 holes completed. A concentrating facility is milling 190 to 200 tons per day (George Cross Newsletter Limited, Number 172, 1983, p.3).

Gold mineralization occurs in quartz veins hosted in a quartz-feldspar porphyry emplaced in sheared mafic tuffs. Veins are laminated or brecciated and can be >1.0 m wide; veins are of multiple generations. A white massive quartz intrudes the typically dark laminated and/or brecciated quartz (both generations of quartz are auriferous). A third generation barren quartz (carbonate) vein cuts the other veins. Mineralization consists of arsenopyrite, pyrite, pyrrhotite, sphalerite, galena, and gold.

## Research in the Beardmore-Geraldton Area

James Macdonald (Mineral Deposits Section, Ontario Geological Survey, Toronto) is continuing a study of the association between gold mineralization and ironstone, specifically studying an extensive hydrothermal system in the Croll Lake Stock and adjacent metavolcanics.

Maurice Lavigne (Mineral Deposits Section, Ontario Geological Survey, Toronto) has initiated a gold study of the Beardmore-Geraldton area supported by funds provided under the Northern Ontario Development Agreement Program (NORDA).

M.W. Carter (Precambrian Section, Ontario Geological Survey, Toronto) completed detailed mapping of Vincent and McComber Townships.

M.M. Kehlenbeck (Lakehead University) began a structural analysis in the Beardmore-Geraldton area, with funds provided by NORDA.

T.J. Barrett (University of Toronto), and P. Fralick and J. Devanney (Lakehead University) are studying the detailed sedimentology of the Beardmore-Geraldton area.

The Geological Survey of Canada supported 2 research programs in the area. Lynn Anglin (Memorial University) continued a study of gold related to porphyries and ironstone. Steve Osterberg (University of Minnesota-Duluth) commenced a study of massive sulphide deposits in the Onaman River area.

## Summary of Exploration Guidelines—Beardmore-Geraldton Area

(1) Large tonnage, although somewhat lower grade, gold deposits occur associated with the porphyries of the south sedimentary belt at or near their contact with

metasediments; an example is the MacLeod-Cockshutt "F-Zone". The porphyries should be examined for this type of deposit.

(2) A number of chert-magnetite ironstones associated with the southern mafic metavolcanic belt, particulaly in Vincent and McComber Townships, should be re-examined for their gold potential.

(3) Recent mapping in Pifher, Irwin, and Elmhirst Townships has shown that large areas previously mapped as mafic to intermediate metavolcanics are in fact felsic metavolcanics. These areas should be prospected for high grade gold-bearing veins associated with sheared felsic volcanic rocks.

(4) Induced Polarization surveys conducted by Scintrex in the Geraldton area have proven successful in delineating sulphide associated mineralization (Marcotte and Webster 1983).

(5) Overburden basal till geochemical surveys for gold and associated metals are recommended.

# Schreiber-Terrace Bay Economic Geologist Program

## Introduction

In April of 1983, the Schreiber-Terrace Bay Economic Geologist Program was initiated by the Ontario Ministry of Natural Resources, and operated from the Resident Geologist's Office in Thunder Bay. The program is funded by the Ontario Ministry of Northern Affairs and is staffed by Resource Geologists B.R. Schnieders and A.A. Speed.

The purpose of the program is 3-fold:

1. to provide assistance and information to prospectors and mining companies working in the area;
2. document old and new mineral occurrences and establish a data base and;
3. to create incentives for mineral exploration and monitor exploration activity.

The program covers an area from Nipigon east to Marathon (Figure 5).

During 1983, approximately 35 properties were visited in the program area (Figure 6). All assays reported in the descriptions below were performed by the Geoscience Laboratories, Ontario Geological Survey, Toronto, unless otherwise noted.

## General Geology

The Schreiber-Terrace Bay area is underlain by Early to Late Precambrian rocks. The Archean rocks are a portion of the Abitibi-Wawa Belt of the Superior Structural Province. They consist of metavolcanic-metasedimentary sequences with metagabbroic intrusions, granite-syenitic plutons, and diabase and lamprophyre dikes (Carter 1980a). The metavolcanics and metasediments consist of mafic to felsic flows, tuff and pyroclastic rocks, ironstone, wacke, and argillite. Granite and syenite batholiths, such as the Terrace Bay batholith intrude the metavolcanics and metasediments. The most common rock type within the batholith is granodiorite/biotite granite (Marmont and Colvine 1981). Mafic intrusive rocks include gabbro and diorite. Middle Precambrian rocks include Gunflint and Rove Formation sediments which unconformably overlie the Early Precambrian rocks. The sediments consist of conglomerate, black shale, and Superior Type ironstone. Late Precambrian rocks unconformably overlie Early and Middle Precambrian rocks. Sibley Group rocks consist of conglomerate, sandstone, shale, and carbonates. Keweenawan rocks are represented by diabase dikes and mafic to felsic metavolcanics and sediments in the Nipigon Bay-Schreiber Channel area. Late Precambrian intrusive rocks include syenite plutons such as the Coldwell Alkaline Complex, gabbro sills, and lamprophyre dikes.

## Economic Geology

Exploration in the Schreiber-Terrace Bay area in 1983 concentrated on gold and base-metal deposits. The area has had an active exploration history since the late 1800s. Gold was first discovered in 1895-1896 at Jackfish and Schreiber (Mohide 1981) by the McKellar brothers of Fort William. Early production came from the Empress Mine (1895-1900) and the North Shore Mine (1898-1900 and 1935-1937). Base metals, mainly zinc and copper, were also discovered by the McKellar brothers (Kite 1981) in the late 1800s. The first production came from the Zenmac (Zenith) Mine in 1898 to 1901 and again from 1966 to 1970.

## Gold Mineralization

Recent studies on controls of gold mineralization and the role of felsic intrusions in gold mineralization in the Schreiber-Terrace Bay area have been performed by Carter (1981a), Marmont and Colvine (1981), and Marmont (1983). Research by Marmont is continuing.

The following sub-division of gold mineralization types is based on their work and property examinations by B.R. Schnieders.

### Type (1) Terrace Bay Batholith—Contact Zone Type

Gold mineralization is concentrated in quartz veins occupying shear zones, faults, and fractures, spatially related to the contact rocks of the Terrace Bay batholith. The veins are generally northeasterly trending and occur within a quarter mile (0.4 km) of the contact of the Terrace Bay batholith (Carter 1980b). Marmont and Colvine

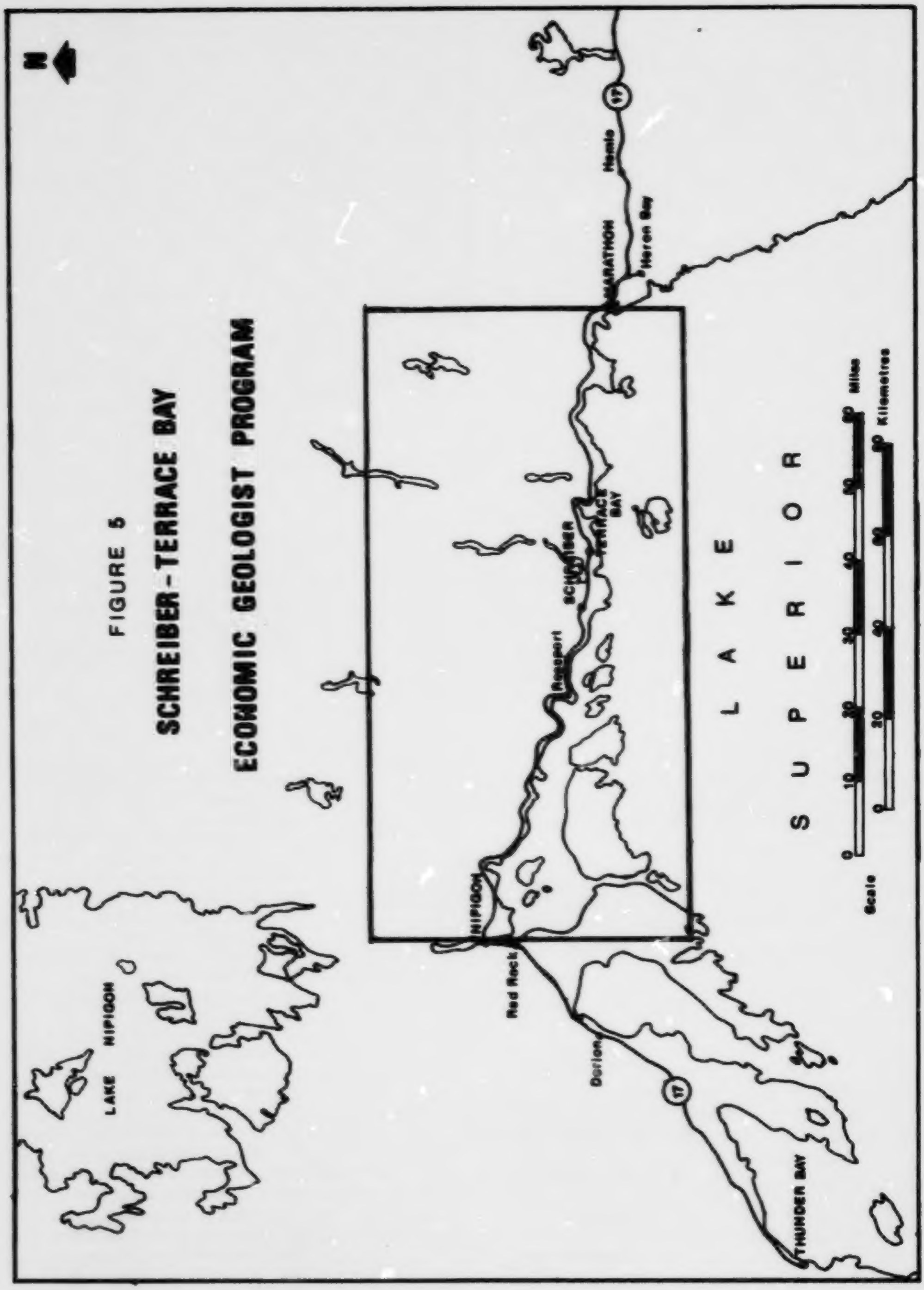
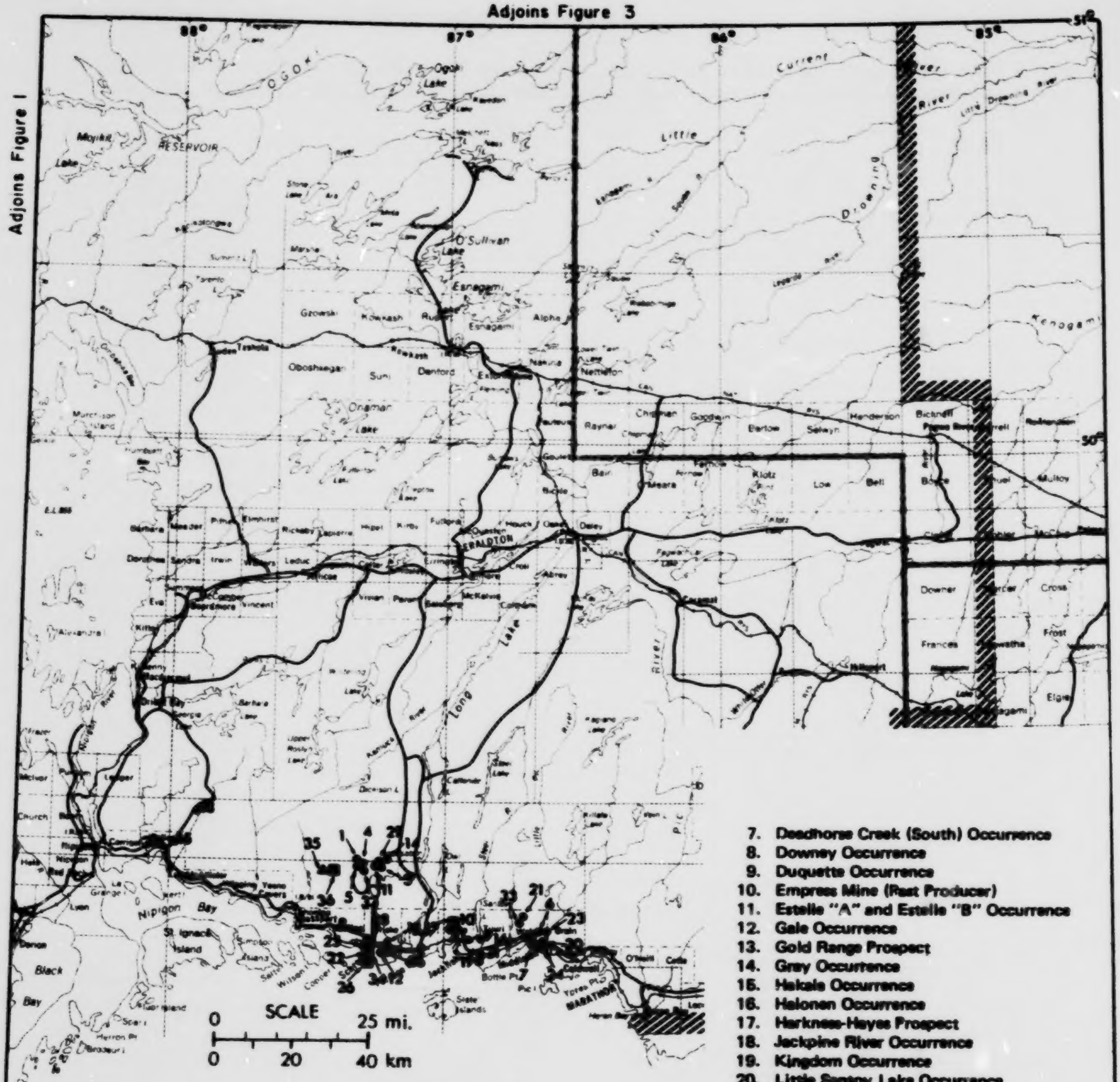


FIGURE 5

SCHREIBER-TERRACE BAY

ECONOMIC GEOLOGIST PROGRAM

N
LAKE NIPIGON
NIPIGON
Red Rock
Dorion
17
THUNDER BAY
Rossport
SCHREIBER
TERRACE BAY
MARATHON
Heron Bay
Hemlo
17
LAKE SUPERIOR
Scale
0 10 20 30 40 50 60 Miles
0 20 40 60 80 Kilometres



Adjoins Figure 3
Adjoins Figure I
88°
87°
86°
85°
51°
50°
OGOKI
RESERVOIR
Ogoki Lake
O'Sullivan Lake
Esnagami
Little
Current
River
Drowning
Kenogami
Onaman Lake
GERALDTON
Long Lake
Nipigon Bay
St. Ignace Island
Black Bay
MARATHON
SCALE
0
25 mi.
0
20
40 km
35
1
4
29
14
7
36
5
32
11
21
33
6
23
22
26
12
20
34

## Figure 6

**Property Visits, 1983: Schreiber Terrace Bay Economic Geologist Program**

- ■ PAST PRODUCER
- ▲ PROSPECT
- ● OCCURRENCE

1. Beaver (McQuaig) Occurrence
2. Blanchford Occurrence
3. Big Birch Occurrence
4. Burstrom Occurrence
5. Coco-Estelle Occurrence
6. Deadhorse Creek (North) Occurrence
7. Deadhorse Creek (South) Occurrence
8. Downey Occurrence
9. Duquette Occurrence
10. Empress Mine (Past Producer)
11. Estelle "A" and Estelle "B" Occurrence
12. Gale Occurrence
13. Gold Range Prospect
14. Gray Occurrence
15. Hakala Occurrence
16. Halonen Occurrence
17. Harkness-Hayes Prospect
18. Jackpine River Occurrence
19. Kingdom Occurrence
20. Little Santoy Lake Occurrence
21. McKellar Bay Mines Occurrence
22. McKenzie Occurrence
23. Michano Occurrence
24. Moneta-Porcupine Occurrence
25. Morley High Grade Occurrence
(Morley Pyrite and Morley Road Occurrence)
26. North Shore Mine (Past Producer)
27. Ozone Creek Occurrence
28. Pitkanen Occurrence
29. Porphyry Shaft Occurrence
30. Renshaw-Tripp Occurrence
31. Simard-Swetz Occurrence
32. Stockwork Occurrence
33. Tomcer Occurrence
34. Univex West Occurrence
35. Winston Lake Prospect
(Corporation Falconbridge Copper)
36. Zenmac Mine (Zenith) (Past Producer)
(Corporation Falconbridge Copper)

(1981) suggest these veins are associated with major lineaments, faults, shear zones, and fractures along north, northeast, and northwesterly trends. The core of the batholith is generally massive. Marmont (1983) suggests the gold veins formed as a result of contact metamorphism and dehydration of the country rocks in a metamorphic-hydrothermal system associated with the emplacement of the batholith. The quartz veins are generally white and glassy, varying in width from a fraction of a centimetre to a few metres (Marmont and Colvine 1981). Mineralization consists of pyrite, pyrrhotite, magnetite, chalcopyrite, galena, molybdenite, tellurides, silver, graphite, and gold. Accessory minerals consist of sericite, chlorite, epidote, carbonate, and hematite. Gold-bearing veins are generally hosted in mafic volcanic rocks, while copper-molybdenum-bearing veins are hosted in felsic intrusive rocks. The veins display a crack-seal or laminated texture indicative of polyphase emplacement. Molybdenite and chalcopyrite are enriched in the host rocks. Examples of this style of mineralization are the Gold Range, North Shore, Harkness Hays, Hays Lake, Gale, and Empress properties.

### North Shore Gold Mine

The North Shore Gold Mine is located in the southwest section of Priske Township approximately 6 km south of Schreiber, and west of Worthington Bay of Lake Superior. The property was discovered in the late 1800s by the McKellar brothers. The property was in discontinuous production from 1889 to 1937, and produced 2441 ounces gold, at a grade of 0.64 ounce gold per ton (Ferguson *et al.* 1971). The deposit occurs within a fault bounded block of mainly felsic metavolcanics and felsic intrusive rocks, with a possible left-lateral displacement of up to 2 km along the Worthington Bay Fault (Harcourt 1939).

A narrow quartz vein varying in width from several centimetres to 1.3 m, strikes from 90° to 100° and dips 50° to 55°S. The vein is reported to average <1 foot wide (0.3 m) (Harcourt 1939) and is exposed for up to 1700 feet (518 m) (Carter 1980a, 1980b).

Two adits were developed to expose and mine what is believed to be the same vein. The vein occupies a fracture in felsic metavolcanics and hornblende syenite.

Mineralization consists of pyrite, chalcopyrite, galena, arsenopyrite, pyrrhotite, tellurides and visible gold, with accessory minerals including sericite, chlorite, hematite, carbonate, and epidote.

A second occurrence was referred to in a 1936 prospectus of the North Shore Mines Limited (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The "rhyolite zone" is located 250 m south of the main adit. The zone trends northwest and can be traced 910 m with an average width of 42 m. The zone is reported to carry interesting gold values.

Grab samples of quartz vein material collected by B.R. Schnieders gave the following analytical results:

| Sample No. | Au (oz/T) | Sample Description |
|---|---|---|
| 83-BRS-1 | 0.31 | inside east adit, quartz vein 8 cm, smokey blue quartz, grab sample |
| 83-BRS-2 | 3.34 | west adit, grab sample from dump, visible gold noted in area, milky quartz |

## Type (2) Porphyry Contact Zone Type

This type of mineralization is spatially associated with felsic porphyries. Within the project area, this deposit type occurs primarily in the Big Duck Lake area, 30 km north of Schreiber. Quartz, feldspar, and quartz-feldspar porphyries intrude several rock types. The sill-like porphyry bodies strike east-west and dip steeply 65° to 70°N, and are considered to have formed late in the tectonic history. Pye (1964) suggested that they are genetically related to the granitic rocks. However, recent detailed mapping by Corporation Falconbridge Copper suggest possible extrusive and intrusive phases of the porphyry (synvolcanic sublayer intrusion) (Gerard Riverin, Senior Exploration Geologist, Corporation Falconbridge Copper, Thunder Bay, personal communication, 1983).

Gold mineralization with subsidiary silver, zinc, copper, lead, and molybdenum occur in quartz, carbonate, or quartz-carbonate veins. The veins are hosted in a variety of rock types, however, there appears to be a preference for the contact between the porphyries and metavolcanics. At least 2 generations of veining are evident; the oldest, parallel to foliation, and younger set which cut the foliation at a high angle. Alteration in the host rocks around the veins includes sericitization, carbonatization, chloritization, and pyritization. Pye (1964) suggests 2 types of vein deposits; (1) sugary quartz, and (2) carbonate.

There is a crude zonal distribution in the mineralogy in the veins. Veins containing gold and molybdenum being the most abundant near Big Duck Lake, while zinc-bearing veins are more abundant near Little Duck Lake.

A number of origins for the vein systems have been suggested:

(1) The Big Duck Lake Porphyry may represent an extrusive-intrusive, synvolcanic, sublayer felsic intrusion, with an associated hydrothermal system. This "volcanogenic association" is described by Marmont (1983, *see* Figure 6). Gold and base-metal mineralization is associated with quartz and/or carbonate veins near the more "extrusive" phases or higher level of the porphyry, suggesting a remobilized/syngenetic-exhalative origin.

(2) Copper, molybdenite, and variable gold mineralization is associated with more "intrusive" phases or lower levels of the porphyry, suggesting an epithermal/magmatic origin.

(3) Emplacement during metamorphism in structural traps developed along the margins of the porphyries.

TABLE 7A | ASSAYS FROM THE COCO-ESTELLE OCCURRENCE

| Sample Number | Au (oz/T) | Ag (oz/T) | Cu (%) | Pb (%) | Zn (%) | Co (%) | Ni (%) | Sample Description |
|---|---|---|---|---|---|---|---|---|
| 83BCE-2 | 0.17 | 0.27 | 0.02 | Tr | Tr | - | - | grab sample, mafic schist, py, dump |
| 3 | 0.55 | 0.61 | Tr | - | - | - | - | quartz vein, selected grab, vein in place |
| 4 | 0.01 | 0.10 | Tr | - | - | - | - | footwall quartz porphyry |
| 5 | 0.10 | 0.10 | 0.14 | Tr | 0.01 | - | - | mafic metavolcanic, minor, py, grab sample |
| 6 | 0.01 | - | - | - | - | - | - | ironstone or dike rock, grab sample |
| 7 | 0.07 | 0.15 | 0.06 | - | - | - | - | hornblende schist, trench, grab sample |
| 8 | 0.01 | - | 0.02 | - | - | Tr | Tr | ironstone from trail, magnetite, py |

Examples of mineralization associated with quartz veins include Estelle A and B, Porphyry Shaft, Burstrom, Gray, Tribe, and Big Birch occurrences. The Beaver or McQuaig occurrence is associated with a carbonate vein.

### Coco-Estelle Occurrence

The Coco-Estelle occurrence is located 30 km north of Schreiber. Access is along a winter road, 1.5 km west of the western end of Big Duck Lake.

The host rocks consist of altered mafic to intermediate metavolcanics (hornblende and hornblende-biotite schists). The metavolcanics have been intruded by quartz-feldspar porphyries. The porphyry sills appear to parallel the bedding.

The bedding and foliation direction strikes approximately east-west, dipping steeply 60° to 70°N. At the south end of the main pit (10 m long by 5 m wide and up to 3 m deep), the footwall rock consists of quartz-feldspar porphyry containing up to 3% pyrite.

A small mafic dike (lamprophyre?), up to 10 cm in width, strikes 102° and dips 70°N. The dike is hosted by a mafic schist which displays evidence of shearing. This schistose rock (Pye's hornblende schist, 1964) can contain up to 10% pyrite and displays both carbonate alteration and a reddish iron gossan. The mafic dike rock is generally fine-grained, magnetic, and has chilled edges, giving the rock a banded or laminated appearance. In a cut sample, the rock exhibits small disseminated carbonate crystals in a very magnetite-rich groundmass.

A sugary quartz vein up to 1 m in width is hosted by the mafic schist. Inclusions of the schist are present within the vein. Mineralization consists of pyrite, chalcopyrite, and possible sphalerite. Accessory minerals include calcite, biotite, epidote, actinolite, sericite, and an unidentified green mica or carbonate mineral. The sulphide mineralization observed makes up to 10% of the quartz vein and mafic schist in the main pit area. Sections of core from previous drilling in the area indicated abundant sulphide mineralization up to near massive concentrations in certain sections. Two possible ages of quartz veining were observed. The oldest is parallel to the foliation, while the younger set crosscuts the foliation at a high angle.

A sample of massive magnetite ironstone, likely of local derivation, was found in the vicinity. The sample contained massive magnetite with up to 10% pyrite mineralization.

Seven samples were collected and submitted for analyses. The results are listed in Table 7A.

### Beaver or McQuaig Occurrence

The Beaver occurrence is located approximately 0.5 km due north of the Coco-Estelle occurrence.

The mineralized zone occurs between a quartz porphyry sill and mafic metavolcanic flows. The hanging wallrocks consist of a schistose quartz porphyry (sericite schist) striking 106° and dipping 32°N. The porphyry unit appears silicified near the contact with the mineralized zone. The mineralized zone consists of a quartz-carbonate unit which parallels both the schistosity and stratigraphy. Two carbonates (calcite and an iron-rich carbonate, ankerite) and quartz make up the major volume of the unit. However, inclusions or seams of actinolite, chlorite, and amphibole are also present. Near the contacts with the porphyry, the carbonate unit displays a laminated or ribbon texture indicating a crack-seal or polyphase deformational history.

In samples from the dump, mineralization consists of pyrite, sphalerite, chalcopyrite, galena, and possible molybdenite. The entire carbonate unit and contact zone rocks appear enriched with pyrite. A shaft (presently part of a creek drainage) and several pits and trenches were observed over a strike length of 75 m. Evidence of diamond drilling is present, with core boxes and core still intact.

Five samples were collected and submitted for analyses (*see* Table 7B).

## Type (3) Metavolcanic-Hosted—Dilatent Zone Type

Gold mineralization occurs in quartz and carbonate veins within shear zones, cleavage dilation zones, and fractures. Carter (1980a, 1980b) defines these deposits as structurally controlled and related to northwesterly striking shear zones. The gold is associated with silver, copper, zinc, lead, and molybdenum. Numerous ages of

TABLE 7B | ASSAYS FROM THE BEAVER OR McCUAIG OCCURRENCE

| Sample Number | Au (oz/T) | Ag (oz/T) | Cu (%) | Pb (%) | Zn (%) | Mo (%) | Sample Description |
|---|---|---|---|---|---|---|---|
| 83 BBV-1 | 0.01 | 0.10 | Tr | - | - | - | quartz, carbonate vein, grab from the dump, actinolite |
| 2 | 0.04 | 0.10 | Tr | - | - | - | quartz-carbonate vein, grab sample, minor py |
| 3 | 0.01 | 0.10 | Tr | - | - | - | gossan from pit, north of shaft, grab sample |
| 4 | 0.58 | 0.10 | 0.01 | - | - | - | quartz-carbonate vein, grab from dump, 2-3% py |
| 7 | 0.52 | 0.92 | 0.10 | 0.87 | 1.10 | Tr | high grade zone from end of dump, py, sp, gn, cp |

veining may be present. The metavolcanic host rocks generally display sericitization, silicification, and carbonatization.

Examples of Type (3) mineralization include the Little Bear, Schreiber-Pyramid, Empress, McKenna-McCann, and Morley High Grade properties.

### Morley Occurrence

The Morley High Grade occurrence could be classified as either a Terrace Bay Batholith—Contact Zone Type (1) or a Lead-Zinc-Silver Vein—Metavolcanic Type (2a, *see* below). However, due to the concentration of gold mineralization and its relationship to felsic metavolcanics, it is described under this mineralization type.

The occurrence is located in the southwest section of patented claim R 606 approximately 4 km southeast of Schreiber. A narrow calcite vein strikes 5° to 10°N and dips 55° to 70°W. The vein varies in width from 10 to 30 cm and is exposed for over 70 m. The vein is hosted by sheared, silicified, and carbonatized felsic metavolcanics with a fragmental texture. The vein contains bands of massive sphalerite and galena, with minor pyrite and chalcopyrite, and displays a brecciated texture. Two other occurrences are located in the same area, the Morley Road occurrence located 0.5 km east, and the Morley Pyrite occurrence located 0.5 km northeast, of the Morely High Grade occurrence. The Morely Pyrite occurrence appears to be a sulphide facies ironstone unit with late-stage cross faulting. Selected grab samples assayed up to 0.04 ounce gold per ton, 1.54 ounces silver per ton, and 0.01% zinc. Selected grab samples from the Morley Road occurrence gave analytical values up to 0.01 ounce gold per ton, 0.44 ounce silver per ton, 0.07% zinc, and 0.07% cobalt. Previous sampling on the Morley High Grade Vein indicated analyses of 0.196 ounce gold per ton, 41.57 ounces silver per ton, 25.85% zinc, 7.06% lead, and 0.185% copper from an average of 30 samples (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Results of recent sampling of the Morley High Grade vein are listed in Table 7C.

## Type (4) Chemical Sediment—Stratabound Type

Gold mineralization is associated with "Algoman-type banded iron formation" (ironstone). Numerous occurrences of Algoman type ironstone occur in the Terrace Bay-Schreiber area. Walker (1967) identifies 3 types of ironstone in the Jackfish-Middleton area; (1) chert, (2) sulphide-rich, and (3) siliceous graphitic schist.

Walker (1967) stated that the predominance of sulphides over magnetite, plus the occurrence of graphite suggests a strongly reducing depositional environment. The ironstones, in general, occur near contacts between metavolcanics and metasediments. However, Carter (1980a, 1980b) describes both oxide and sulphide facies ironstones interlayered with sedimentary and volcanic rocks in the immediate Schreiber-Terrace Bay area. The sulphide mineralization within the ironstone may represent a later hydrothermal or epigenetic concentration of reprecipitated iron and sulphur (Walker 1967). Further detailed work on these ironstones will be performed as part of a M.Sc. thesis by B.R. Schnieders. Examples of the Chemical Sediment—Stratabound Type include the Kingdom, Simard-Swetz, Morley Pyrite, Morley Road, and Clem Downey properties.

### Kingdom Occurrence

The Kingdom occurrence is located approximately 15 km east of Terrace Bay and 2 km northwest of Bottle Point near Santoy Bay. An Algoman-type sulphide facies ironstone strikes northeast, has a near vertical dip, and varies up to 10 m in width. The ironstone consists of interlaminated pyrite, graphitic slate, and minor chert. It is situated

TABLE 7C | ASSAYS FROM THE MORLEY HIGH GRADE VEIN

| Sample Number | Au (oz/T) | Ag (oz/T) | Cu (%) | Pb (%) | Zn (%) | Sample Description |
|---|---|---|---|---|---|---|
| 83 BMHG-1 | 0.01 | 6.06 | 0.04 | 0.04 | 0.54 | 0.6 m chip, footwall rhyolite |
| 2 | 0.28 | 66.56 | 0.05 | 0.86 | 22.6 S. end | high grade vein, 25 cm chip, massive sulphides |
| 3 | 0.01 | 13.17 | Tr | 0.06 | 0.22 | 30 cm chip sample, hanging wall, altered rhyolite |
| 4 | 0.09 | 29.35 | 0.03 | 0.86 | 29.0 | grab sample, vein material from dump |
| 83 BMP-A | 0.23 | 2.31 | 0.05 | 0.55 | 1.00 | north end of Morley high grade vein, quartz breccia |

between graded turbidite sequences (and a possible tuffaceous unit) to the northwest and pillowed metavolcanics to the southeast. The metasediments have been folded and have a well developed axial planar cleavage, especially in the graphitic slates. Late diabase dikes and a felsic porphyry intrude the sequence in the vicinity of the ironstone. Narrow quartz veins parallel to the cleavage are present. Further detailed mapping and sampling will be performed by the author. Sampling by C.J. Baker (Prospector, Timmins, Ontario, personal communication, 1983) of a pyrite-rich section assayed at up to 0.08 ounce gold per ton. Samples collected by B.R.Schnieders were assayed, and the results are shown in Table 7D.

TABLE 7D | ASSAYS FROM THE KINGDOM OCCURRENCE

| Sample Number | Au (ppb) | Au (oz/T) | Zn (ppm) | Cu (ppm) | Sample Description |
|---|---|---|---|---|---|
| 83 BTA-1 | 2120 | 0.06 | 277 | 221 | fine-grained dike, main py zone |
| 2 | 21 | Tr | 81 | 67 | carb. zone tuff pillow rim 2-5% py |
| 3 | 430 | 0.01 | 62 | 42 | quartz vein within volcanics, fine-grained py |
| 4 | 17 | Tr | 94 | 59 | laminated chert, sulphide bands |
| 5 | 310 | 0.01 | 340 | 29 | main zone, massive slate, graphitic |
| 6 | 370 | 0.01 | 193 | 89 | main zone, massive py layers |

# Base Metals

## Type (1) Volcanogenic Massive Sulphide Deposits

Base metals are associated with felsic pyroclastic rocks in the Schreiber-Terrace Bay area. To date, the most significant discovery is that of Corporation Falconbridge Copper on their Winston Lake property located 27 km northwest of Schreiber. The Winston Lake property includes the Zenmac (Zenith) Deposit which was discovered in the late 1800s. Zinc ore was first mined from 1898 to 1901, producing 1065 tons averaging 45% zinc (Tanton 1931). Mining again took place at the Zenmac Mine from 1966 to 1970, with production realizing 181 830 tons, with an average grade of 16.5% zinc (Unger 1980). The Zenith Deposit is part of a volcanogenic massive sulphide deposit which was rafted into a gabbro intrusive (Kite 1981). In 1980, Corporation Falconbridge Copper optioned the property from Zenmac Exploration Limited, and carried out a detailed program of geological mapping, geochemical surveys, diamond drilling, and down hole geophysical work. A new ore zone located approximately 0.5 km west of the Zenmac Deposit was geologically discovered. Tonnage and grade estimates from the 500 m long zone indicate 2.95 million tons grading 17.8% zinc, 0.94% copper, 0.7 ounce silver per ton, and 0.025 ounce gold per ton (The Northern Miner, November 24, 1983, p.1). The orebody is hosted by felsic pyroclastic rocks near, and in contact with, a gabbroic intrusion. Alteration includes anthophyllite-cordierite-garnet-bearing schists and biotite-quartz schists. Drilling by the company has indicated high grade gold values, up to 0.58 ounce gold per ton (uncut) across 3.55 m (The Northern Miner, July 28, 1983). Corporation Falconbridge Copper is presently involved in a 4-month feasibility study.

## Type (2a) Zinc-Lead-Silver Veins—Metavolcanic Type

Zinc, lead, and silver mineralization is concentrated within narrow carbonate and quartz veins within shear zones, faults, and fractures, associated with metavolcanics and metasediments. Mineralization generally consists of massive sphalerite and galena within a banded carbonate vein. Silver appears in concentrations proportional to the galena content. The veins also contain minor chalcopyrite and gold mineralization. Accessory minerals include quartz, epidote, chlorite, sericite, and ankerite. Examples of this type of mineralization include Deadhorse Creek North and the Deadhorse Creek South prospects.

### Deadhorse Creek North Prospect (Ollmann Prospect)

The Deadhorse Creek North prospect is located in Walsh Township approximately 4 km north of the Middleton station, on the west side of Deadhorse Creek and 0.5 km north of Highway 17. The property was examined by American Yellowknife Gold Mines Limited in 1944 and again in 1947-1948. Twenty diamond-drill holes totalling 5022 feet (1522 m) were drilled. The sulphide mineralization, exposed in trenches for 220 m, occurs in a brecciated calcite vein. The vein strikes 90° to 100° and dips 80°N to vertical, varying in width from several centimetres up to 2 m. Sampling by American Yellowknife Gold Mines Limited indicated 7.28% zinc, 1.45% lead, and 8.27 ounces silver per ton over a length of 257 feet (78 m) and width of 3.7 feet (1.1 m) (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). The banded calcite vein contains massive and brecciated sphalerite and galena, with minor pyrite. Accessory minerals include quartz, ankerite, epidote, sericite, and hematite. The vein is hosted by mafic metavolcanic flows which have suffered carbonatization and chloritization. Coarse-grained mafic flows or intrusive rocks are present in the immediate area. Selected grab samples indicated 27.0% zinc, 0.49% lead, and 11.22 ounces silver per ton. Grab samples assaying as high as 27.04% lead, 16.84% zinc, and 56.40 ounces silver per ton have been reported by Walker (1967).

## Type (2b) Lead-Zinc-Barite Veins—Unconformity Type

The lead-zinc-barite veins have been previously investigated by Tanton (1931), and Franklin and Mitchell (1977). The latter classified the lead-zinc-barite deposits of the Dorion region as spatially associated with the unconformity between Proterozoic and Archean rocks.

Franklin and Mitchell (1977) described the deposits as follows:

> *The veins are coarse-grained, and mineralogically zoned with galena-calcite in the central zone, sphalerite-quartz surrounding the central zone, and barite (± chalcopyrite) in the vein extremities. Veins occur near the pinch-out of the "Pass Lake Formation" (basal Sibley Group), within the dolomite of the overlying "Rossport Formation", or in the nearby basement fractures. Rossport dolomite, where it forms a vein wall, is highly altered to metal-enriched chert and calcite. Archean wallrocks are not altered.*

and

> *The deposits formed from metal leached from either basement rocks or breakdown of Sibley sandstone matrix. Metals and sulphide moved through the permeable sandstone, probably as choride-iron complexes, and precipitated at the sandstone pinch-out. Reduced sulphur, possibly derived from organic decay, and probably held in a gas trap at the sandstone pinch-out, caused precipitation of the sulphides by reaction with metal-bearing brines.*

Examples of Type (2b) include the Enterprise, Ozone, Dorion, Hilma, Silver Lake, and Caribou Occurrences.

### Ozone Creek Occurrence

The Ozone Creek occurrence is located on claims TB3745 and TB4737, approximately 0.8 km (one-half mile) northerly from Ozone siding on the Canadian Pacific Railway. Tanton (1931) describes a "composite vein" which "cements a shatter zone 9 m (30 feet) or more in width in a pegmatite granite-gneiss".

A granite breccia was found on the east and west sides of Ozone Creek between 2 rapids or small waterfalls flowing westerly into the creek.

Angular pieces of granite are cemented by white and amethystine quartz. The breccia is vuggy and also contains pink barite needles and galena crystals. Both brown and black varieties of sphalerite are present in the breccia. A large stripped and trenched area is located on top of the bank on the west side of the creek (the breccia zone also occurs on the east side of the creek opposite the old workings).

Two other trenches were found about 0.4 km (¼ mile) westerly from the creek showing. These pits were dug on similar granite breccia with pink sugary quartz and barite, and mineralized sparsely with galena. Here the barite is both massive and crystalline.

Grab samples indicated trace amounts of gold and silver, with up to 3.08% lead and 0.77% zinc.

## Type (3) Copper-Molybdenum Vein Type

This style of mineralization could be viewed as a sub-type of the gold-bearing veins associated with the Terrace Bay batholith. The copper-molybdenum-bearing veins are generally hosted in felsic intrusive rocks, whereas the gold-bearing veins are hosted in mafic volcanic rocks.

Both vein types are similar and are classified on their mineralogy and gold content. Marmont and Colvine (1981) suggest a magmatic/hydrothermal source within the higher levels of the batholith during intrusion. They further suggest that the western and southern parts of the Terrace Bay batholith represents a higher or outer intrusion, due to the numerous xenoliths, roof pendants, and mineral occurrences.

The copper-molybdenum veins generally contain copper and molybdenite mineralization and assay <0.10 ounce gold per ton. The veins are generally lenticular, discontinuous, and erratic, displaying a banded or laminated texture. Mineralization consists of chalcopyrite, molybdenite, pyrite, pyrrhotite, silver, and minor gold. Examples include the Blanchford, Pitkanen, McKenzie, Gale, and Univex occurrences.

### Gale Occurrence

The Gale occurrence is located on patented claims TB 3869, TB 3870, and TB 3841 approximately 5 km southeast of Schreiber, in Priske Township. Prior to 1926, the property was owned by Fenning Development Company which sank a vertical shaft to a depth of 255 feet (77 m), with 525 feet (159 m) of crosscutting, and 190 feet (58 m) of drifting (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). A quartz vein varying up to 0.9 m wide, exposed for 303 m, was observed striking 057° and dipping 56° to 68°SE. The vein is hosted by 2 phases of felsic intrusions (syenite and granite) on the footwall and by a mafic intrusive or recrystallized mafic volcanic xenolith on the hanging wall. Assimilated combinations of felsic intrusive rock and mafic volcanic rocks are present. The quartz vein displays a banded or crack-seal texture. Mineralization consists of chalcopyrite, pyrite, molybdenite, sphalerite, magnetite, silver, and gold. Galena, as well as gold values up to 0.16 ounce gold per ton have been reported (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Accessory minerals include epidote, sericite, carbonate, and chlorite. Assay results are shown in Table 7E.

## Summary of Exploration Guidelines—Schreiber-Terrace Bay Area

### Gold

Exploration for gold in the Schreiber-Terrace Bay area should include a thorough re-examination of past-producers, prospects, and occurrences discovered in the

TABLE 78 | ASSAYS FROM THE GALE OCCURRENCE

| Sample Number | Au (oz/T) | Ag (oz/T) | Cu (%) | Zn (%) | Mo (%) | Sample Description |
|---|---|---|---|---|---|---|
| 83BDG-1 | 0.01 | - | 0.11 | - | - | chip across 2.5 ft. vein S. end of shaft |
| 2 | 0.02 | - | 1.08 | 0.04 | - | grab sample of 5-10% sulphides |
| 3 | 0.02 | - | 7.15 | - | - | chip sample across 3' |
| 5 | 0.03 | - | 1.50 | - | - | footwall, chlorite schist |
| 6 | 0.03 | - | 3.80 | - | - | quartz vein |
| 7 | 0.04 | - | 0.59 | 0.1 | .01 | hanging wall, hematite stain |
| 8 | 0.01 | 0.10 | - | - | - | diabase dike-mafic xenolith, hanging wall |
| 9 | 0.01 | 0.10 | - | - | - | carbonate unit, dump |
| 10 | 0.01 | 0.10 | - | - | - | ironstone, py, po massive, quartz vein |
| 11 | 0.01 | 0.10 | - | - | - | gabbro, diorite amphibolite |
| 83BGO-1 | 0.10 | 3.54 | 3.30 | - | - | quartz vein, py, cpy, Mo, 40% sulphides, grab |
| 2 | 0.01 | 0.10 | - | - | - | ironstone, vein |

past 90 years. While many of the properties such as the North Shore, Gold Range, and Empress Mines have undergone development of generally narrow quartz veins, little exploration was done to test the surrounding host rocks. Highly sheared, carbonatized, and silicified metavolcanics and felsic porphyries contain disseminated sulphide mineralization. These require detailed sampling and analyses. Northeast- and northwest-trending lineaments should be explored and tested in the metavolcanics, as well as the perimeter of the Terrace Bay Batholith.

Numerous auriferous veins are associated with the contact zones and peripheries of intrusions, including the Big Duck Lake Porphyry and Terrace Bay Batholith. Further exploration in these areas as well as other felsic intrusions is warranted. Algoman, sulphide facies/ironstone in the Schreiber-Terrace Bay-Marathon areas should be sampled and analyzed for gold. Although many of these units contain sub-economic levels of gold mineralization, they may represent protore and gold mineralization source rocks for a sedimentary-exhalite origin, from which second generation deposits could have developed.

## Base Metals

Exploration for massive volcanogenic sulphide deposits in the Schreiber-Terrace Bay area is recommended in 3 general areas:

(1) Winston Lake-Big Duck Lake Area: Exploration by Corporation Falconbridge Copper has recently discovered a zinc-copper-silver ore deposit, hosted by felsic pyroclastic rocks, near a gabbroic intrusion. Areas mapped as metasediments (pelites) should be re-examined; these may represent altered metavolcanics.

(2) Schreiber Point-Worthington Bay Area: Numerous narrow base metal veins, gold veins and sulphide facies, ironstones are reported hosted within felsic to mafic metavolcanics.

Sulphide facies ironstone (iron-rich units) appear to represent stratabound, chemical exhalative sediments, and contain low zinc and copper values. They may represent distal portions of base-metal deposits.

(3) Santoy Lake-McKellar Lake Area: A large felsic metavolcanic unit trends west-northwest. This unit is host to metal occurrences including the Marlhill, Prairie River, Goldbar, and Bozena Lake occurrences. Siliceous, graphitic schists are commonly sulphide-bearing, with low base-metal values, and may represent sulphide facies ironstone, of a sedimentary-exhalative origin. Felsic metavolcanics in the Fisher Lake area are mapped as "andalusite-bearing tuff" by Walker (1967) and may represent alteration zone rocks.

## Recent Exploration Activities

Corporation Falconbridge Copper has continued detailed mapping and diamond drilling on their Winston Lake property. Falconbridge is presently involved in a 4-month feasibility study. A total of 7.6 million dollars is slated for a 510-metre development shaft on the property (The Northern Miner, November 24, 1983, p.1). Exploration also began in the Big Duck Lake area where linecutting, stripping, and detailed mapping and geochemical surveys were performed during 1983. A 3-year multiphase exploration program is planned for this area.

Noranda Exploration Limited carried out numerous exploration programs for gold and base metals along the north shore of Lake Superior during summer, 1983. Projects included the Cancer Lake, Charlotte Lake, Sandridge Lake, Second Lake, Victoria Lake, and Santoy Lake areas.

Stralak Resources Incorporated conducted a diamond drilling program on the Deadhorse Creek North prospect (Ollman property).

Dynamic Oil Limited, Cumberland Resources Limited, Redfern Resources Limited, and Saco Resources Limited conducted linecutting, geochemical sampling, and geophysical airborne surveys on their 75-claim group in Tuuri Township and their 18-claim group in Walsh Township. Geochemical results indicated anomalous amounts of precious and base metals (George Cross Newsletter Limited, Number 161, 1983). Cumberland Resources Limited conducted an airborne geophysical program on their 11 claims in Walsh Township, and a geochemical survey on 5 claims in Syine Township.

Micham Exploration Incorporated optioned the Empress Gold Mine and conducted exploration on an adjoining block of 50 claims, including prospecting, geological mapping, and Induced Polarization and MAXMIN geophysical surveys. Results indicate a carbonatized volcanic zone, up to 3.2 km (2 miles), along strike of the Empress Mine workings with gold values as high as 0.50 ounce gold per ton (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). Also, a similar zone 3.2 km (2 miles) to the northwest, previously known as the Mocon Valley area, has been outlined for over 1092 feet (333 m). Gold values from 0.10 to 0.50 ounce gold per ton have been obtained from this zone (Resident Geologist's Files, Ontario Ministry of Natural Resources, Thunder Bay). A drilling program is expected in early 1984.

Melrose Resources Incorporated conducted airborne magnetic and electromagnetic surveys, prospecting, and linecutting, with geochemical and geophysical surveys. The 32-claim block is located approximately 5 km north of Terrace Bay.

Wildrose Petroleum Limited conducted linecutting, geophysics, geological mapping, and soil sampling on their Terrace Bay property.

United Continental Energy Corporation and Fisher Financial Corporation conducted prospecting on the 162-claim group near Terrace Bay.

Kalrock Developments conducted an airborne geophysical survey on its 21-claim group tied on to the Zenmac property (The Northern Miner, July 21, 1983).

Kingdom Resources Limited conducted prospecting on their Terrace Bay-Steel River property (Kingdom occurrence). Geophysical and geochemical surveys are slated for 1984 (Jack Bergman, Consultant, Kingdom Resources Limited, Toronto, Ontario, personal communication, 1983).

Lormac Explorations Limited is presently drilling on their Schreiber property, northeast of the Gold Range occurrence, in Priske Township.

Wasabi Resources Limited have completed an airborne geophysical survey, along with prospecting and mapping on a 44-claim property in the Terrace Bay area (The Northern Miner, October 13, 1983).

Nuinsco Resources Limited is presently involved in exploration on their wollastonite, uranium, and niobium property, in the Prairie Lake carbonatite complex located 50 km northeast of Terrace Bay:

> *Drilling in 1977 indicated a large tonnage, open pitable deposit grading about 25% (percent) wollastonite as well as significant amounts of nepheline.*
>
> (The Northern Miner, November 3, 1983).

A drill program is slated for early 1984.

Numerous local prospectors and junior companies incuding J. Ferguson, L. Duquette, W. Acker, R. Podester, D. Michano, J. Bond and D. Mocnik, C.J. Baker and W.N. Baker, J. Ternowesky, P. Skalesky, R. Renner, J. Turcotte, V. Stenlund, C. Scherman, B. Michon, J. Hakala, J. Halonen, L. Halonen, R. Doyan, and R. Hamel, continued work on various properties in the Schreiber-Terrace Bay area.

## Research Activities—Schreiber-Terrace Bay Area

B.R. Schnieders (Resource Geologist, Resident Geologist's Office, Ontario Ministry of Natural Resources, Thunder Bay) (Part-time Graduate Student, Lakehead University, Thunder Bay) will investigate, map, and collect data on various sulphide-facies, ironstone units as part of a M.Sc. thesis in the Schreiber-Terrace Bay area. Research initially began in late 1983 and will continue into 1984 and 1985, under supervision of P. Fralick and M.M. Kehlenbeck. Further research on these iron-rich units is planned by P. Fralick (Lakehead University) and T.J. Barrett (University of Toronto).

B. Nelson (4th year Student, Lakehead University, Thunder Bay) is doing his B.Sc. thesis on the intrusive and extrusive nature of the Big Duck Lake Porphyry, with cooperation of Corporation Falconbridge Copper.

S. Marmont (Geologist, Mineral Deposits Section, Ontario Geological Survey, Toronto) is continuing research in the Terrace Bay area on gold, copper, and molybdenum mineralization associated with Early Precambrian felsic intrusions in Ontario.

## Till Sampling and Gold Exploration

Till may be conceived of as crushed and transported bedrock (Shilts 1982). Due to its wide distribution, ease of identification, ease of relating to known ice transport directions, direct derivation from local bedrock, and straight line transport, till has become the prime glacial sediment for prospecting in areas of glaciated terrain. The glacial erosion of a point bedrock source results in its dispersion, in the form of an indicator train, in a downglacier direction. The dispersion train, due to its greater surface area, is easier to detect than the source and therefore comprises the target during the initial phase of till sampling. It is the delineation of the dispersal train which provides the means of tracing back to source. Two recent case histories documenting the use of till sampling in gold exploration are presented below.

### Beardmore-Geraldton Area

Cominco Limited holds 54 claims in Colter and Lindsley Townships situated in the northeast portion of the Beardmore-Geraldton Gold Camp. The local bedrock consists of east-west trending, predominantly clastic, metasediments consisting of argillite, siltstone, wacke, conglomerate, and iron formation. The nearest past gold producer is the Jellicoe Mine, located in Lindsley Township. The Jellicoe Mine produced 4238 ounces of gold from 1939-1941 at a grade of 0.4 ounce gold per ton.

A significant feature of the Cominco Limited claims is a thick overburden of till ranging from approximately 2 to 45 m in depth. Consequently, a program of till sampling, using a reverse circulation overburden drill (Bradley Brothers, Timmins) was conducted. The drill was located on the south portion of the claim block, downglacier from a magnetically-inferred, east-west trending unit of iron formation. To date, 19 boreholes, at a reconnaissance scale grid spacing of ¼ mile, have been completed. Reverse circulation overburden drilling represents an efficient and cost-effective technique for mineral exploration in areas of thick glacial drift. The cost of the 19 boreholes is apparently comparable to 2 moderate length diamond-drill holes.

The drill was mounted upon a Flextrac Nodwell all-terrain vehicle. The lengths of drill rod are designed with inner and outer compartments. Water was pumped down through the outer compartment to a tricone bit, where a slurry of water and drill cuttings was formed. The slurry was returned to the ground surface via the inner compartment, and directed through ¼-inch mesh screen into a settling container. Debris which accumulated upon the screen during the drilling process was constantly monitored in order to detect changes in lithology and texture. Samples were collected from both the screen and the settling container. The bedrock was also systematically sampled during the drilling process.

Based on observations made during 1-day property visit (2 boreholes), the authors conclude that 2 units of till overlie the bedrock on the Cominco Limited ground. These consist of an upper, loose, sandy till characterized by a lithology dominated by rocks of distant provenance (i.e. Paleozoic carbonates), overlying a more compact, finer grained till exhibiting a lithology composed for the most part of rocks of local provenance (i.e. mafic metasediments; very likely, chloritic mudstone or argillite). The bedrock intersected during drilling operations the day of the visit consisted of a carbonatized, chlorite-sericite schist possibly representing chloritic mudstone or argillite. A field investigation (Sado 1975) of the "Quaternary Geology of the Wildgoose Lake Area, District of Thunder Bay" provides some confirmation of the above observations.

It is considered that these units of till very likely were deposited in the subglacial environment. The geomorphology of the claim group is dominated by linear, ice-moulded features (i.e. drumlinoid ridges and fluted moraine) composed of till trending approxiately southwest. A lineated till plain implies the presence of active ice at the time of its formation. It is suggested that the lower till was deposited predominantly through lodgement processes, and the upper till, primarily by meltout deposition. In this regard, the upper till might represent late phase glaciation during which meltout processes, associated with relatively static ice conditions, alternated with shorter term, more dynamic periods, during which the ice-moulded and lineated pattern was imprinted upon the ground surface. A thin, discontinuous veneer of extremely bouldery morainic debris, possibly representing a minor supraglacial component, was observed locally, overlying the above discussed till units.

It was extremely important that samples be collected consistently from the lower unit. It is the lower unit, in the particular case of the Cominco Limited claims, which is dominated by rocks of local provenance. The samples were assayed directly for gold. The detection of anomalous values would introduce phase 2 of the exploration program, which would involve the implementation of a much tighter grid, and additional overburden drilling in the areas of the anomalous values. It is during this phase that delineation of the dispersion train is attempted. Finally, detection of the source introduces a third phase based on conventional diamond drilling.

## Hemlo Area

The Hemlo Belt, part of the Abitibi-Wawa Belt, generally is composed of felsic-mafic metavolcanics and pyroclastic rocks, and metasediments. The Hemlo Belt is presently being subjected to an unprecedented level of gold exploration. Noranda Mines Limited, Teck Corporation, and Lac Minerals Limited, to date, have proven 18.1 million ounces of gold in the main deposit. Numerous other gold occurrences, for example, the Ore Quest Occurrences, are also being investigated.

The Ore Quest claim group in Pic Township, underlain to the south by mafic volcanic rocks, and to the north by felsic volcanic rocks and minor metasediments, apparently conforms to a major mafic-felsic contact in the Hemlo area. This contact appears to be host to a Hemlo type gold mineralization. Ore Quest has made extensive use of geochemical techniques in the exploration of their Hemlo area holdings.

The claim group comprises 2 terrain types, bedrock uplands and silty sand lowlands. A geochemical investigation must account for these differences. The upland areas are characterized by extensive areas of exposed bedrock, and minor, thin, discontinuous till. Surface and shallow overburden techniques are favoured. For example, humus and "B" horizon soil sampling was conducted in the upland component of the claim group. The lowland areas are underlain by a thick overburden of glaciolacustrine silty sand, which apparently fines with depth to a silty clay. Based on vertical sections exposed in the Rous Lake Pit, which is situated nearby in lowland terrain in Lecours Township, it is considered that this fine grained, sedimentary fill may exceed several hundred feet in thickness. Obviously, a deep overburden technique is required. A till sampling program, based on reverse circulation overburden drilling, was conducted in the lowland component of the claim group.

## Quaternary Geology—Hemlo Area

### Aggregate Resources

The Corporation of the Municipality of Marathon, the Improvement District of Manitouwadge, and the Improvement District of White River, located on the periphery of the Hemlo area, are expected to undergo a period of rapid expansion due to mine developments. Indeed, the construction of 600 residential units is underway in the Municipality of Marathon. The centres of Marathon, Manitouwadge, and White River require a detailed surficial geological data base for planning purposes. For example, they must be aware of the location of potential gravel sources within the areas of jurisdiction in order to properly manage extraction activity, and prevent unnecessary development, or other constraining land uses, in areas of high aggregate potential. As a result, a program of detailed surficial geological mapping at a scale of 1:50 000 of the planning areas of Marathon, Manitouwadge, and White River was carried out during the summer of 1983.

A phased approach (i.e. I. Data Collection and Review, II. Field Reconnaisance, and III. Report and Map Production) was considered. The study began with a literature search and review. Ontario Ministry of Environment water well records and Ontario Ministry of Transportation and Communications sand and gravel inventory data were reviewed. Satellite imagery enlargements at a scale of 1:250 000, and conventional aerial photography at 1 inch to 1 mile and 1 inch to ¼ mile scales were obtained. A preliminary aerial photograph interpretation was conducted.

During the second phase of the project, all preliminary interpretation was subjected to a program of field verification. The objective was to obtain as many points of ground truth as possible in the study areas. Navigable roads were traversed by vehicle, and all sand and gravel pits, and borrow pits, were visited. Detailed ground truth of the geomorphology and surficial geology of the study areas was obtained. In fact, during the course of the field season, the locations of approximately 450 field stations, each representing a point of ground truth, were recorded.

The third phase of the study is currently underway. A report and map describing the surficial geology of each township will be forthcoming. Aggregate potential and coarse aggregate probability maps, derived from prepared surficial geological mapping, also will be prepared.

## Drift Prospecting

Although our intent was to document the occurrence, character, and distribution of all classes of surficial material in each township, special emphasis was placed on till sequences throughout the Hemlo area. This was due to the significance of till from a mineral exploration perspective. Effectively, till comprises a prime sampling media for mineral exploration in areas of glaciated terrain.

A fine grained, calcareous, gritty, silt till is ubiquitous in the Hemlo area. Generally, it occurs as a thin, discontinuous, but widespread sheet, which overlies a polished, striated and grooved bedrock surface. The till can be subdivided into lower and upper units. The lower unit may be described as a compact, fissile, gritty, silt till. The upper unit comprises a loose, gritty, sandy, silt till. The geotechnical and textural differences between these units are attributed to a shift in sedimentary style. It is considered that the lower unit was deposited predominantly through lodgement processes, whereas, the upper unit was deposited for the most part by meltout processes. The lithology of the till is decidedly exotic, and exhibits a variety of rock types of distant provenance. For example, a substantial component of subround to round pebbles and cobbles of carbonate composition were observed. These rocks are of Paleozoic age, and probably were eroded from bedrock sources in the Hudson Bay and James Bay Lowlands.

The impressive array of erosional features exhibited by the underlying bedrock surface (e.g. polished, striated, and grooved surfaces) suggests that prior to deposition of the gritty, silt till, a prolonged and intensive period of glacier erosion took place. Also, the high percentage of rock types of distant provenance indicates that a substantial component of the till is exceedingly far-travelled. It is probable that prior to its deposition in the Hemlo area, this gritty, silt till underwent an extended period of englacial transport (R.S. Geddes, Engineering and Terrain Geology Section, Ontario Geological Survey, personal communication, 1983). It would not be unreasonable under these circumstances to predict the absence, or, at most, the meager development, of dispersal trains downglacier from bedrock sources in the Hemlo area. It is perhaps of some significance that Grant (1969, p.198) and Garrett (1969, p.47) were unable to define "the usual geochemical anomaly from glacial dispersion" downglacier from the Geco Mine and Big Nama Creek Mine, in the Manitouwadge area. The utility of this exotic gritty, silt till from a drift prospecting point-of-view is suspect. Certainly, much detailed field investigation remains to be done.

## Uranium Exploration

Uranium exploration activity in the North Central Region has diminished from the level of just a few years ago. This decline is due mainly to the low demand for uranium coupled with current depressed price structure for the metal. At present, only Saarberg Interplan Canada Limited is continuing their uranium exploration program in the Thunder Bay-Nipigon area. Assessment work reports submitted by Uranerz Exploration and Mining Limited describe several previously unknown uranium occurrences in the Frazer Lake area which is 100 km (62 miles) northeast of Thunder Bay. The occurrences, as described by Uranerz Exploration and Mining Limited, are relatively small and not economic. It is significant that many of the showings are associated with highly altered and hematized granitic basement rocks; this may indicate the existence of a regolith in the Sibley Basin. Its extent, however, has not been defined. A report on uranium in the North Central Region is currently in preparation by staff of the Resident Geologist Office.

The showings are located on Uranerz's Malborne Lake and Frazer Creek grids and have been summarized by Uranerz Exploration and Mining Limited as follows:

| Name | Rock Type (Setting) | Dimension | Maximum Value recorded (SPP-2) |
|---|---|---|---|
| Tuesday | In hematized granitic rock | 0.5 m x 20 m | 2,500 c/s |
| Wednesday | In hematised granitic rock | 14 boulders | 2,000 c/s |
| October | In hematized brecciated and non-brecciated granitic rock | 27 boulders | 6,000 c/s |
| Harry's | Near a hematite veinlet in fresh granitic rock | 1 cm x 0.5 m | 15,000 c/s |
| Frazer Creek | In Archean meta-sediment | 40 m x 40-50 m | 10,000 c/s |
| Thursday | Associated with apatite(?) in granitic rock | few cm x 1 m | 10,000 c/s |
| Malborne Lake | In fractures in hematized migmatite | 2 fractures<br>1st: 1 cm x 1.5 cm<br>2nd: 1-2 cm x 15-20 cm | 15,000 c/s |

Only the Malborne Lake occurrence has been visited by Resident Geologist staff. Property visits to the others are planned for the 1984 field season.

In most cases, hematite alteration is associated with the radioactivity. Uranerz Exploration and Mining Limited conducted an exploration program consisting of geophysical, geochemical, and geological surveys. The geophysics consisted of EM-16, magnetometer, and scintillometer surveys. The geochemical surveys consisted of lake sediment, stream sediment, and soil sampling programs. The results of these programs were not encouraging in the company's opinion and, until the uranium market improves, their efforts in the Nipigon Basin have been curtailed.

# Ontario Geological Survey Activities

The research activities of the Ontario Geological Survey have been described above by area: Hemlo area — T.L. Muir, G.M. Siragusa, J.A.C. Fortescue; Beardmore-Geraldton area — A.J. Macdonald, M.J. Lavigne, M.W. Carter; Schreiber-Terrace Bay area — S. Marmont and M.C. Jackson (Precambrian Geology Section, Ontario Geological Survey) mapped the western half of the Lumby Lake area, 30 km southwest of Upsala. For further details the reader is referred to Wood *et al.* (1983). Table 8 lists maps and reports published during this year by the Ontario Geological Survey, Ontario Ministry of Natural Resources.

# Research by Other Organizations

## Geological Survey of Canada

Activity by the Geological Survey of Canada included a metallogenic study on the relationship of gold to ironstones in the Beardmore-Geraldton area by L. Anglin and J. Franklin. A regional geological compilation of Northwestern Ontario, emphasizing the granitic terrains, is being compiled by J. Percival. Work at Hemlo by Geological Survey of Canada personnel is described in the section on "Hemlo Area Research".

## Lakehead University

B.Sc. Theses (in progress)

- Evans, Noreen—Rare Earth Geochemistry of Lamprophyres of the Coldwell Complex
- Laderoute, Dave—A Mineralogical and Geochemical Analysis of Metamorphic Zonation Around Ultramafic Inclusons in Rocks of the Killala Lake Area
- McKay, Doug—Methods for the Determination of Rare Earth Elements in Silicate Rocks
- Nelson, Brian—Shales as Source Beds for Silver Veins in the Rabbit Mountain Area
- Sarvas, Perry—Structure and Stratigraphy of Coutchiching and Keewatin Strata, Wara Township
- Sim, Robert—Accretionary Lapilli in Rocks in the Kakabeka Falls Area
- Smyk, Mark—Island Belt Silver Occurrences
- Stewart, Ron—The Structure and Lithologies of the Chub Lake and McCauley Lake Areas

B.Sc. Theses Completed in 1983

- Clarke, G.—Geology of the West Coldwell Peninsula, Coldwell Complex
- Laws, G.R.—Geology of a Portion of the Little Pic River, Breccia Zone, Within the Coldwall Complex
- Stubley, M.P.—The Structure and Lithology of the Quetico Metasediments in the Banning Lake-Seine Lake Area
- Twomey, T.—Metallogeny and Soil Geochemistry of the Lake Head Gold Mines Property, Thunder Bay, Ontario

M.Sc. Theses (in progress)

- Brown, Heather—Structure and Stratigraphy of Timiskaming Rocks in the Shebandowan-Shabaqua-Finmark-Lappe Areas
- Devaney, Jon—Structure and Stratigraphy of Metasediments in the Beardmore-Geraldton Area
- Kennedy, Myra—Mylonites of the Quetico Fault Zone
- Schnieders, Bernard—Depositional Setting of Pyrite Facies Banded Iron Formation in the Terrace Bay Area
- Zayachkivsky, Borys—Geochemistry of Spodumene-Bearing Pegmatites, Georgia Lake Area

TABLE 8 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Report 221 Study 25
Report 227

Open File Reports

OFR 5333
OFR 5463
OFR 5466
OFR 5468
OFR 5469

Preliminary Maps - Geological Series

P. 1068 (revised, 1983)
P. 2592
P. 2593

GEOLOGICAL DATA INVENTORY FOLIOS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| GDIF 8 | 13 | 18 | 23 | 30 | 35 | 40 | 45 | 50 | 55 |
| 9 | 14 | 19 | 24 | 31 | 36 | 41 | 46 | 51 | |
| 10 | 15 | 20 | 25 | 32 | 37 | 42 | 47 | 52 | |
| 11 | 16 | 21 | 26 | 33 | 38 | 43 | 48 | 53 | |
| 12 | 17 | 22 | 29 | 34 | 39 | 44 | 49 | 54 | |

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

2452 (reprint) 2457
2456 2591

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

MP 108 MP 114
MP 110

Geological Survey of Canada Open File Reports

INDUSTRIAL MINERALS REPORTS

IMR 33 (reprint)

## Other Staff Research Activities

Borradaile, G.J.

(1) Structure and Strain Analysis of Metasedimentary and Metavolcanic Rocks West of Thunder Bay

(2) Flow, Fabric and Magnetic Suscepibility of Metamorphic Rocks West of Thunder Bay

Fralick, P.W.

(1) Sedimentological Development of Greenstone Belts in Western Ontario

(2) Banded Iron Formation—Clastic Associations and Depositional Models in the Beardmore-Geraldton Greenstone Belt (with T.J. Barrett)

Recent Publications:

Fralick, P.W., and Barrett, T.J. (1983)
The Sedimentology of Banded Iron Formation in the Beardmore-Geraldton Greenstone Belt: A Preliminary Appraisal; p.204-206 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Barrett, T.J., and Fralick, P.W. (in preparation)
Sediment Redeposition in Banded Iron Formation: Examples from the Archean Beardmore-Geraldton Greenstone Belt, Ontario; Geology.

Kehlenbeck, M.M.

(1) Structural Studies in the Beardmore-Geraldton Area (funding by NORDA).

Recent Publications:

Kehlenbeck, M.M. (in press)
Structural Studies in the Hazelwood Lake Area, Thunder Bay.

Kehlenbeck, M.M., and Cheadle, S.P. (in prep)
Gravitational Studies in the Shebandowan Area and Quetico Subprovince, Thunder Bay and Vicinity.

Mitchell, R.H.

(1) Studies of Alkalic rocks from Poohbah Lake, Coldwell, Chipman Lake, Prairie Lake, Squaw Lake and Sturgeon Lake.

Recent Publications:

Mitchell, R.H., Platt, R.G., and Cheadle, S.P. (in press)
A Study of the Coldwell Complex, Northwestern Ontario and its Petrological Significance.

Other Recent Publications:

Mothersill, J.S. (in press)
The Use of Paleomagnetic Curves for Chronostratigraphic Correlation of Late Quaternary Fluvial, Esturine and Lacustrine Stratigraphic Sequences in Nipigon Bay, Lake Superior; Chemical Geology.

Platt, R.G., Mitchell, R.H., and Holm, P.M. (in press) Rb-Sr and K-Ar Geochronology of Ultrabasic Lamprophyres from the Vicinity of McKellar Harbour, Northwestern Ontario, Canada; Canadian Journal of Earth Sciences.

Platt, R.G., Mitchell, R.H., and Cheadle, S.P. (in press) A Gravity Study of the Coldwell Complex, Northwestern Ontario, and its Petrological Significance; submitted to Canadian Journal of Earth Sciences.

## Other Universities

Cogulu, Ersen—Petrology of Great Lake Nickel Deposit, University of Ottawa.

Cheadle, B.—Stratigraphy of Sibley Group, Ph.D. Thesis, Queen's University.

Morton, R.—Alteration at Winston Lake Deposit, University of Minnesota, Duluth.

## Historical Research Project

Over the past 3 years, the Regional Mineral Resources Co-ordinator's Office has been involved in a historical research project of the North Cental Region. This project is an in-depth search of the old literature (government reports, newspapers, magazines, etc.) for information on mineral occurrences. Each description of an occurrence is copied, referenced, and filed in our Mineral Deposits Files. This is an ongoing, part-time project that will probably not be completed for many years. Table 9 indicates the areas of search that have been completed.

## Initial Conclusions

(1) Historical research is an excellent prospecting tool. The old local newspapers are a tremendous untapped resource for documenting the mining and exploration history of an area.

(2) Descriptions, approximate locations, and assays of many mineral occurrences not documented in the old or new government reports have been unearthed. Ground truthing, hopefully, will be the next local step in this project.

(3) Valuable information has been added to our files on the old gold occurrences in the Atikokan, Beardmore-Geraldton, and Schreiber-Terrace Bay areas. The number of occurrences and the data on the known occurrences of silver and lead-silver in the Thunder Bay area has been doubled.

(4) The potential of the silver and lead-silver occurrences in the Thunder Bay area appears to be higher than previously thought. Areas north and northwest of Whitefish Lake (Strange and Jean Townships) and surrounding Cloud Lake (Crooks Township) are good prospecting locales for silver.

**TABLE 9 | ARTICLES RESEARCHED – HISTORICAL RESEARCH PROJECT**

| Source Articles | Issues and Dates |
|---|---|
| 1. Annual Reports of the<br>Ontario Bureau of Mines &<br>Ontario Department of Mines | Vol. 1, 1891<br>to<br>Vol. 36, 1927 |
| 2a.Canadian Mining Review | Vol. 1, No. 7, May, 1883<br>to<br>Vol. 27, December, 1906 |
| 2b.Canadian Mining Journal | Vol. 28, 1907<br>to<br>Vol. 81, December, 1960 |
| 3. The Pre-Cambrian<br>(published Winnipeg, Man.) | Vol. 13, No. 1, January, 1940<br>to<br>Vol. 31, No. 12, December, 1958 |
| 4. "Gold" Magazine<br>of Canada's North | Vol. 2, No. 1, 1933<br>to<br>Vol. 7, No. 12, 1940 |
| 5. The Daily Booster<br>- A weekly newspaper<br>dedicated to the<br>advancement of the<br>Sturgeon River Mining<br>Area<br>(published Jellicoe, Ont.) | 1936 - April 15, May 13 & 27<br>June 3, December 3, 10&24<br>1937 - January 7, 14, 21 & 28 |
| 6. North Shore Mine<br>(published Port Arthur's<br>Landing) | 1880 - No. 1, September 7<br>No. 10, November 9<br>No. 15, December 14<br>1881 - No. 22, February 1 |
| 7a.Port Arthur Sentinel | 1875 to 1877 |
| 7b.Thunder Bay Sentinel | 1878 to 1881 |
| 7c.The Daily Sentinel | 1882 to 1891 |
| 8. The Weekly Herald | 1882 to 1890 |

## Examples

Below are 2 samples of the type of write-ups found in the old newspapers. The Cloud Lake Silver location was not staked, as of November 22, 1983.

### (1) Cloud Lake Silver Location

*It is situated on the N.E. ¼ of Lot 5, Con. 2, township of Crooks; comprises 174 acres and has two well defined, strongly mineralized lodes. No. 1 vein has a general northeast and southwest strike, with an average width of five feet, and can be traced on the surface for 1,000 feet.*

*No. 2 vein has an east and west strike, with an average width of four feet, and joins No. 1 about midway on the exposed part; from the point of intersection eastward as far as the vein is exposed, it has an average width of eight feet. A shaft 12 feet was sunk at the contact of the two veins. The lowest assays from rock, showing no silver, gave $300, the highest $2,900, per ton. The silver is in the form of argentite and zinc blende. It is the intention of the owners to proceed with the development of the property at once.*

(The Weekly Herald, Saturday, August 2, 1890).

### (2) Mocon Valley Gold Location

*This most promising property is situated three and one-half miles north of the C.P.R. at Jackfish Bay. The north end of the location borders on Mocon Lake. Several quartz veins intersect the location, two of which carry free gold. One of them, which may be said to be the main vein of the location, is in about the centre of the location striking eastward across the mountain from the valley above mention. It has been exposed here and there over a distance of about 1000 feet, from the foot of the hill up the face of, and back on the summit; it is a strong fissure vein, from two to six and a half feet wide, of quartz with an inch of clay on the footwall in the tunnel.*

*The tunnel was driven in on the vein for 30 feet at the foot of the mountain, 25 feet above the level of the valley. The vein here is four to seven feet in width, and carries considerable auriferous pyrites, assaying $22 gold of 2000 pounds. On the surface, about 50 feet further east the vein carries free gold, and it is expected that if the tunnel was driven in to cut that point it would show free gold also; in fact a few colors were shown in the last blast put into the tunnel. The vein in the tunnel dips 60 degrees to the south. Thirty-five different tests have been made on this vein, in pulverizing, roasting and washing, and with few exceptions turned out a good showing of gold dust in the pan. A test of 1290 pounds made by the Northwestern Reduction and Chemical Works of Chicago of the rich part of the vein gave an average of $41.34 gold to the ton of 2000 pounds. Assays from other parts of the vein by C. Kreissman, M.E., late of this town, gave an average of $20 gold to the ton of 2000 pounds.*

*The second vein bears N.N.W. dips westward 30 degrees to the horizon, and lies about 15 chains to the east of the tunnel and will intersect the main vein. It is three feet wide and consists of decomposed quartz. No assays have been made of this vein, but it shows free gold in considerable quantities by panning.*

(The Weekly Herald, Saturday, July 5, 1890).

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1981a: Precambrian Geology of the Schreiber Area, East Part, Thunder Bay District; Ontario Geological Survey, Preliminary Map P 2391, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1979.

1981b: Precambrian Geology of the Terrace Bay Area, East Sheet, Thunder Bay District; Ontario Geological Survey, Preliminary Map P.2418, Geological Series, scale 1:15 840 or 1 inch to ¼ mile. Geology 1980.

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# Report of Activities 1983
# Timmins Resident Geologist Area, Northern Region

**L.E. Luhta[1] and P.J. Sangster[2]**

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## Resident and Resource Geologists' Activities

At present, staff at the Timmins office includes: W.O. Mackasey, Mineral Resources Co-ordinator; L.E. Luhta, Resident Geologist; P.J. Sangster, Resource Geologist; and J. Hunter, Secretary. Katherine Burke, Secretary, retired in November after 21 years of service with the Ministry. In addition, D. Draper and B. MacRae were employed during the year as Geological Assistants on a contract basis. L. Perron was hired as a Summer Assistant under the Experience '83 Program. C.D. Hamblin is working as Drill Core Librarian under a contract administered by the Timmins District Office, Ontario Ministry of Natural Resources.

Exploration activity in the area, especially for gold, surpassed even the high level of the previous year (1982) and the staff spent considerable time in consultative duties. Emphasis was placed on examining and reporting on properties currently being explored and/or developed. Other activities included geological input to land-use plans and geological assessment of areas proposed as candidate parks and reserves. Also included in these activities were: conducting and attending geological field trips and tours, participating in and organizing geological discussion group sessions, and presenting lectures on area geology to various groups.

Construction was completed on the Porcupine Mining Division Drill Core Storage Library, and to date approximately 40 000 m of core have been placed in storage at the library. Of this stored cored, approximately 18 000 m consists of core collected in 1983. Additional core, currently stored at the Regional Office and at a temporary core storage building at the District Office in Timmins, has yet to be transferred to the Drill Core Library. During 1983, drill core was donated by the following companies/organizations: Augdome Corporation Limited; Canamax Resources Incorporated; Gossan Resources Limited; Gowest Amalgamated Resources Limited; Gulf Minerals Canada Limited; Lacana Mining Corporation; Newmont Mines Limited; Noranda Mines Limited; Onexco Minerals Limited; Ontario Geological Survey; Samim Canada Limited; Utah Mines Limited; Vedron Limited; Westmin Resources Limited.

## Claim Staking Activity

As of December 1983, over 11 160 claims had been staked in the Porcupine Mining Division as compared to the 5 250 recorded in 1982. Active stakers included P. Ferderber; G. Leliever; Ingamar Explorations; and C. Mortimer. Intensive staking activity occurred in the following areas: Horwood, Reeves, Penhorwood, and Keno-

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**TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGIST'S AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES**

Open File Reports

OFR 5386 - Industrial Minerals of Northern Ontario
OFR 5427 - Borehole Mining of Silica Sand and Kaolinite Clay in the James Bay Lowlands
OFR 5438 - Garnet Lake Area
OFR 5439 - Industrial Minerals of Northern Ont. -Supplement 1
OFR 5445 - Westree Sand Deposits, Westbrook and Garvey Twp
OFR 5450 - Peat and Peatland Evaluation of the Hearst Area
OFR 5452 - Peatland Inventory Project: Laboratory Analyses 1982/83-Hearst, Armstrong, Peterborough & Pembroke
OFR 5453 - A Comparative Geochemical Study of Some Peatlands of Northern Ont.
OFR 5464 - Applications of Stable Isotope Studies of Gold Metallogeny in the Timmins Porcupine Camp
OFR 5467 - Preliminary Report on the Timmins-Kirkland Lake Area Gold Deposits File

Aggregate Resources Publications

ARIP 89 - Aggregate Resources Inventory of the Central Part of the City of Timmins
ARIP 90 - Aggregate Resources Inventory of the Eastern Part of the City of Timmins

Miscellaneous Papers

MP 107 - Report of the Activities Regional and Resident Geologist
MP 110 - The Geology of Gold in Ontario

Preliminary Maps

P. 2582 - Quaternary Geology of the Dana Lakes Area
P. 2606 - Precambrian Geology of Brunswick Township
P. 2679 - Quaternary Geology Kamiskotia Lakes Area
P. 2680 - Quaternary Geology Pamour Area

Studies

Study 25 - Gold Exploration in the Timmins Area Using Field and Lithogeochemical Characteristics of Carbonate Zones

gaming Townships; Halcrow, Tooms, and Greenlaw Townships; Mallard, Osway, Heenan, Yeo, and Chester Townships; Evelyn and Dundonald Townships; Turnbull and Carscallen Townships; Foch, Lessard, Lizar, Ermine, Derry, Hawkins, and Walls Townships; Brackin and Lang Townships; and the Sunday Lake and Lower Detour Lake areas (*see* Figures 4 and 5).

There are presently over 29 836 active claims in the Porcupine Mining Division as compared to 23 204 at this time last year. This represents approximately 1 193 500 acres of land being explored, and does not include work done on the numerous patented claims, or the areas held under Exploratory Licences of Occupation.

## Exploratory Licences of Occupation

Four companies now hold exploratory licences of occupation within the Cretaceous Basin.

Selco Incorporated, a division of BP Exploration Canada Limited, was granted an area of 243 000 acres of 1980. In 1982, Selco Incorporated surrended part of this area, retaining 146 560 acres, and in 1983 further reduced the acreage to 7200 acres.

The Ontario Energy Corporation was granted 1 050 000 acreas in 1980. In 1982, this licence was transferred to Onexco Minerals Limited, a subsidiary company, and reduced to 279 600 acres. In 1983, Onexco Minerals Limited retained 150 000 acres.

The Douglas Taylor Joint Venture licence consisted of 10 400 acres in 1981 and no reductions have been made in this area.

Lignasco Resources Limited, whose original 1981 grant was for 92 745 acres, now has been reduced to a total of 1200 acres.

## Operating Mines

### Base Metals

Although the actual 1983 figures are unavailable at the time of writing, the projected production for 1983 at the Kidd Creek Mines Limited base-metal mine in Kidd Township is 4 138 200 tonnes. In 1982, the company produced and processed 4.3 million tonnes of ore from which 371 600 tonnes of zinc concentrate, 311 800 tonnes of copper concentrate, and 26 300 tonnes of silver-lead concentrate were produced. The amount of silver recovered was 166 550 kg. The company's zinc plant produced 105 600 tonnes of refined zinc from 210 400 tonnes of concentrate. The balance of 161 200 tonnes of concentrate was available for direct sale. The company's copper smelter treated 118 600 tonnes of copper concentrate. The balance, 193 200 tonnes, was smelted and refined elsewhere in Canada. Total refined copper production was 67 400 tonnes. A minor amount of cadmium and tin concentrate were also produced. The decreased production in 1983 is attributed to a slower milling rate in order to maximize recovery.

At the Number One Mine, 74% of the production came from above the 2000-foot level with the bulk of the production from between the 1200- and 1600-foot levels. At the Number Two Mine, 26% of the total production came from between the 2600- and 3400-foot levels. All of the production is from blast-hole stopes except for a minor amount of ore coming from sublevel caving. Thirty percent of the production is derived from pillar recovery in the Number One Mine. The deposit is virtually mined out above the 800-foot level and 75% of the ore has been depleted between the 2600- and 2800-foot levels in Number Two Mine.

Proven and probable reserves to the end of 1982 totalled 78.4 million tonnes containing 2.9% copper, 5.0% zinc, 0.2% lead, and 67.0 gm of silver per tonne.

In 1983, development at the Number One Mine totalled 9867 m (6497 m of lateral, and 3370 m of vertical development). At the Number Two Mine, development totalled 6150 m (4730 m of lateral, and 1420 of vertical development). This compares with the 1982 figures of 9281 at the Number One Mine and 10 156 m at the Number Two Mine. Underground diamond drilling totalled 25 000 m, of which 10 000 m was classified as exploration. All exploration was done to trace the ore laterally between the 2500- and 4000-foot levels of Number Two Mine.

The number of persons employed in mining and metallurgy at Kidd Creek Mines Limited in Timmins in 1983 was 2832. This is slightly lower than the 1982 figure of 3050 people (Kidd Creek Mines Limited, personal communication, 1983)

## Precious Metals

The $92 million expansion started in 1981 at the Dome Mine in South Porcupine is expected to be completed in 1984. Production will be increased from 2000 to 3000 tons per day. The new shaft (Number 8 Shaft), planned to reach 5400 feet, is presently 100 feet from completion. Lateral drifting to Number 8 shaft is 60% completed and ore and waste passes are 80% complete. Mill expansion was completed in July 1983. The mine will be producing 3000 tons per day by December 1984.

In 1982, production totalled 85 201 ounces of gold from 708 000 tons milled. Recovery was 95.9%. A total of 670 000 tons averaging 0.128 ounce gold per ton were drawn from stoping activities. The 1983 production figures are unavailable at the time of writing, however, the tonnage has been increased to a current rate of 2300 tons per day. A higher average grade for the year is expected due to an additional 37 400 ounces recovered from the clean up of old milling equipment in the fall of 1983. Ore sources by mining method are: 32% cut and fill, 50% long hole, and 8% from development.

Ore reserves by the end of 1982 were estimated to be 2 142 000 tons grading 0.197 ounce gold per ton. Over 50% of the mill feed is still extracted above the 2000-foot level. The lowest working level at the Dome Mine is the 4000-foot level. The main ore structures have been traced below this level and are open to depth.

A total of 21 727 feet of underground development (drifts, sill drifts, cross cuts, and raises) was completed in 1983 compared to 18 692 feet in 1982. Underground diamond drilling totalled 58 500 feet of which 25% is considered exploratory drilling. Of this drilling, 7000 feet were in long holes drilled from new drives to the Number 8 shaft (Dome Mines Limited, personal communication, 1983).

The Detour Lake Joint Venture, owned by Amoco Canada Petroleum Company Limited and Campbell Red Lake Mines Limited, began processing gold ore obtained from open pit mining of their gold deposit, 200 km northeast of Timmins, on July 27, 1983. Full production of 2500 tonnes per day was obtained in October, and to the end of December 1983, the company mined and milled 303 500 tonnes of ore. The pouring of the first gold bar took place September 29, 1983.

The total cost of bringing the mine into production was $139 million; the project began in early 1981. Ore will be mined initially by open pit methods to a depth of approximately 125 m. The estimated life is 5 years. Current plans are for a $110 million expansion and underground development to supply ore from underground in 1987, by which time mill capacity will have been increased to 4000 tonnes per day. Shaft sinking, to a depth of 600 m, is scheduled to begin in the third quarter of 1984. Published probable ore reserves, including dilution, are 27 733 000 tonnes at 3.88 gm gold per tonne (0.113 ounce gold per ton) down to the 550-m level.

At the end of 1983, there were 283 permanent employees, and this number will rise to approximately 500 when underground mining begins (Detour Lake Joint Venture, personal communication, 1983).

Pamour Porcupine Mines Limited's 1983 production figures are not yet available, however, it is estimated that the company will mine and process 1 311 000 tons of its own gold ore. The grade is expected to be similar to that of 1982 when the company produced 1 637 000 tons of ore grading 0.084 ounce gold per ton. This lowered tonnage for 1983 is due to a 7-week strike at the company's operations. An approximate breakdown for the 1983 production is given below:

| | |
|---|---|
| Pamour Number 1 (underground) | 490 000 tons |
| Ross Division (underground) | 240 000 tons |
| Schumacker Division (underground) | 220 000 tons |
| Pamour Number 3 (underground) | 58 000 tons |
| Timmins Property (underground) | 95 800 tons |
| Timmins Property (surface) | 200 000 tons |
| Miscellaneous | 8 000 tons |

Pamour custom milled 230 000 tons of gold ore for the following companies: Kidd Creek Mines Limited; Consolidated Louanna Gold Mines Limited; Phelps Dodge, Brenbar Mines Limited.; Brown McDade Resources Limited; Kienna Gold Mines Limited, and Goldlund Mines Limited.

At the end of 1982, the proven mineral inventory was 2 725 000 tons averaging 0.10 ounce gold per ton. Probable and possible mineral inventory contains an additional 6.11 million tons averaging 0.097 ounce gold per ton.

In 1982, the company completed 5482 feet of underground development (drifts and raise) and 109 240 feet of diamond drilling. The 1983 totals will be slightly less due to the strike. At the end of 1983, there were 968 people employed at Pamour Porcupine Mines Limited's operations in Timmins as compared to 930 this time last year (Pamour Porcupine Mines Limited, personal communication, 1983).

The Owl Creek Gold Deposit in Hoyle Township, jointly owned by Kidd Creek Mines Limited (the operator) and Inco Limited (the discover), has been producing gold ore by open pit methods since November 1981. In 1983, 239 000 tonnes of ore were mined at an average grade of 4.1 gm gold per tonne (0.13 ounce gold per ton). Pamour Porcupine Mines Limited milled 177 436 tonnes of Owl Creek ore and the remainder was processed at Kidd Creek's own concentrator. Thirty percent of the ore (higher grade material) is in graphitic argillites, 50% in mafic volcanic rocks, and 20% in wacke. The open pit is currently down to number 3 bench (40 m below surface). Open pit ore reserves remain at just over 900 000 tonnes, sightly down from last year. (Additional reserves were located at the western end of the pit in 1983.) The operation employed 25 people on a regular basis with an additional 7 people from the base-metal mine who were employed intermittently (Kidd Creek Mines Limited, personal communication, 1983).

## Industrial Minerals

Steetley Talc Limited is continuing a $3.76 million expansion program started in 1982 at its Timmins operations. A grant of up to $940 000 was obtained by the company from the Government of Ontario through the Board of Industrial Leadership and Development (BILD). The expansion, to be completed in 1985, consists of a series of small projects to bring the total talc production up to 36 000 tons per year. Production in 1983 included open pit mining and stockpiling of 67 401 tons of ore during the summer months. During the year 23 100 tons of beneficiated talc was produced. The ore is mined and the talc concentrated at the mine site in Penhorwood Township. The concentrate is trucked to the company's fine grind plant in Timmins. The product is sold to the pulp and paper, paint, cosmetic, plastics, and rubber industries. Steetley Talc Limited presently employs 50 people at its Timmins operations. This is an increase of 10 over 1982 (Steetley Talc Limited, personal communications, 1983).

## Property Evaluation and Development Projects

St. Andrews Goldfields, a subsidiary of Quebec Sturgeon River Mines Limited, completed a $14-million equity financing to carry out a 2-year underground development program on the company's Stock Township gold deposit. The deposit was discovered in 1973. Underground development and exploration was done in 1981. The new program consists of deepening the shaft from the 270 feet reached in 1981 to 650 feet. Lateral development on 2 more levels, underground diamond drilling, bulk sampling, mill testing, and a feasibility study are also scheduled. As of December 1983, shaft sinking has been completed and lateral development is to begin on the second (325-foot) and the third (450-foot) levels. Earlier development outlined inferred reserves of 580 375 tons at 0.14 ounce gold per ton (undiluted). Most of these reserves are between 200 and 325 feet below surface (St. Andrews Goldfields, personal communication, 1983; Northern Miner, November 24, 1983).

Kidd Creek Mines Limited discovered the Hoyle Pond deposit in 1980, just northeast of their Owl Creek gold deposit in Hoyle Township. Five mineralized veins were located by diamond drilling. An exploration/development underground decline was started in the summer of 1983 to reach the deposit 720 m laterally from the collar. At the time of this writing, December 1983, the decline has advanced 450 m and the face is 70 m below surface. The final depth is to be 120 m and the gold mineralization will be intersected in the spring of 1984 (Kidd Creek Mines Limited, personal communication, 1983).

Canamax Resources Incorporated plans to begin shaft sinking in the spring of 1984 on its Bell Creek gold project in Hoyle Township. The deposit is held in joint venture with DuPont of Canada Explorations. DuPont of Canada Explorations announced in late 1983 that they will be dissolving all their mining interests. At the time of this writing, the company has yet to announce their plans with regard to the Bell Creek project. The underground development and exploration project is estimated to cost $12 million and includes the sinking of a shaft to 280 m and development of 4 levels. In 1983, the company diamond drilled 9498 m in the vicinity of the deposit and began construction on a 4 km access road and powerline right of way to the property. Published reserves are 526 000 tons at 0.21 ounce gold per ton (Canamax Resources Incorporated, personal communication, 1983; Northern Miner, December 8, 1983).

Gail Resources, a private company with financing from Buffalo, New York, purchased the old Carshaw Gold Property in Shaw Township from Gowganda Resources Incorporated. The latter company carried out a major evaluation program on the property in 1982 which consisted of dewatering the old underground workings, underground sampling and drilling, and surface drilling. In 1983, Gail Resources blasted and stockpiled approximately 100 000 tons of surface material and is presently constructing a mill on the property. Initially, mill feed will be obtained by open pit mining. Underground development and mining will commence if feasible (Gail Resources, personal communication, 1983).

Davidson Tisdale Mines Limited has been re-evaluating the old Davidson Gold Property in Tisdale Township. Work has included stripping and surface sampling of the main vein area and 2 other areas of extensive veining. A continuing surface diamond-drill program is being done to outline gold mineralization around the main vein and to attempt to interpret the structure of the mineralized shoots. The underground workings were pumped out and a geological mapping and sampling program was done on the 4 levels of the mine (Davidson Tisdale Mines Limited, personal communication, 1983).

Orofino Resources Limited, a subsidiary of Northgate Exploration Limited, obtained financing, through a public offering of warrants and shares in early 1983, to continue an exploration and evaluation program on their gold deposit in Silk and Horwood Townships. Northgate Exploration Limited drilled over 64 000 feet in 1980 and 1981. A new "replacement zone" was discovered aside from the gold-bearing "fracture-filled" quartz veins which were previously known. In 1983, an additional 15 000 feet of diamond drilling was done to further delineate the deposit and to explore for the projected extensions of the zones. Other targets were also drilled. The underground workings were pumped out and a geological mapping and sampling program was completed. Results were reported to be very encouraging. The ore host is a medium to coarse grained mafic rock. A debate on its origin is still continuing as to whether the rock is an intrusive or a thick coarse grained volcanic flow.

Published drill-indicated reserves from work done previous to the 1983 program are 825 000 tons at 0.17 ounce gold per ton (Orofino Resources Limited, personal communication, 1983).

Asarco Incorporated announced that they will be bringing their Aquarius Gold Deposit in Macklem Township into production. The cost is estimated to be another $3.4 million before production is started in mid-1984. No reserve estimates have been released by the company. During the last 4 years, Asarco Incorporated sunk a 570-foot shaft, completed 2990 feet of lateral development, drilled a total of 39 000 feet from both surface and underground, and installed a 150 ton-per-day pilot mill at a cost of $U.S. 7.3 million. The capacity of the mill will be increased to 300 tons per day (Northern Miner, October 6, 1983).

Vedron Limited drilled 15 diamond-drill holes this year on the old Fuller Gold Claim in the southern part of Tisdale Township. The company plans to drive an underground decline to intersect the gold mineralization at 120 feet below surface for underground exploration purposes. Vedron Limited has arranged with Pamour Porcupine Mines Limited that by extending the ramp onto the adjacent ground of the latter company, it can earn a 33% interest in that property. At the time of this writing, the company has completed site preparation for the decline (Vedron Limited, personal communication, 1983; Northern Miner, July 7, September 15, 1983).

Canreos Minerals Limited has obtained the rights to the old Brominco gold property in Brackin Township, just south of the Renabie Mine in Leeson Township. Five thousand tons of material are to be mined and shipped to Noranda's Horne Smelter in Quebec for a fluxing test, and a minor amount to Pamour Porcupine Mine's milling operation in Timmins. Reserves based on previous work are estimated to be 128 000 tons at 0.15 ounce gold per ton.

Diamond drilling to extend these reserves and explore other targets obtained in geophysical surveys is to commence this winter (Canreos Minerals Limited, personal communications, 1983; Northern Miner, September 29, December 1, 1983).

Diepdaume Mines Limited maintained the underground workings of the old Preston East Dome Mine to the 500-foot level. Feasibility studies are being done with regard to mining remnant gold mineralization from the mine. Mill construction was started on the property. Surface exploration, including diamond drilling, was done on the property adjacent to the mine workings (Diepdaume Mines Limited, personal communication, 1983).

Brown McDade Resources Limited entered into an agreement in 1983 with Hollinger Argus Limited and Esso Minerals Canada for these companies to explore their claims in Denton Township. A 3000-foot diamond-drill program (14 holes) was completed in late 1983. One of the holes was reported to have intersected gold values scattered interimittently for over 100 feet. Another 3000-foot program to follow up on this intersection will be started in early 1984. Brown McDade Resources Limited mined 3000 tons of material from the property in 1982 and a minor amount in 1983. Milling was done at the Pamour Porcupine Mines facilities in Timmins (Brown McDade Resources Limited, personal communication, 1983; Northern Miner, May 26, September 15, October 20, 1983).

Wabigoon Resources acquired the old Hunter Gold Property on the shore of Porcupine Lake in Whitney Township. Stripping, mapping, and sampling of the veins on the surface was started in the late summer and fall of 1983. The company has reported that $2 million will be spent on the evaluation of the property. Work will include dewatering of the underground workings and carrying out a mapping, sampling, and diamond drilling program (Wabigoon Resources, personal communication, 1983; Northern Miner, September 15, September 29, 1983).

Sulpetro Minerals Limited drilled 9 holes (1954 m) to explore for the down dip extension of gold mineralization of the Rundle Gold Deposit in Swayze Township during the winter of 1983. The property is held under option from Hollinger Argus Limited. A road was built this summer to the property southward from the Orofino Property in Horwood Township. Drilling is planned in the new year to test geophysical targets on the property (Sulpetro Minerals Limited, personal communication, 1983).

Murgold Resources Incorporated carried out an exploration program consisting of pitting, trenching, sampling, and further prospecting on their claims in Chester Township in 1983. Underground development on the Number 3 vein may begin in 1984 (Northern Miner, August 11, 1983).

Osway Explorations Limited obtained an option to purchase the Jerome Mine, a former producer in Osway Township, from Eddy Forest Products Limited. A feasibility study has recently been completed on the deposit. A headframe was erected over the shaft, the underground workings pumped out, and a sampling program completed in 1981 by Bridgeview Resources Incorporated, a private company who previously held an option on the property. Some diamond drilling was done. Osway Explorations Limited carried out a diamond-drill program of approximately 40 holes on ground adjoining the Jerome Property in Osway and Huffman Townships in late 1982, and early 1983 on geophysical and geochemical targets. A number of surface showings were drilled. Narrow erratic gold-molybdeum intersections and lead, zinc, silver intersections were obtained (Northern Miner, March 24, May 26, June 23, 1983).

Heron Resources Limited obtained an agreement to acquire the old Kenty Gold Property in Swayze Township. The company reported that they would spent $350 000 to evaluate the property, which will include gaining access to the old underground workings and mapping and sampling the developed gold mineralization. In 1983, the company built 8 km of access road to the property from an existing road, cleaned some old trenches, sampled some of the exposed veins on surface, cut lines over the whole property, and conducted geological and geophysical surveys (Northern Miner, April 28, 1983).

## Exploration Activity

Exploration activity in the Timmins Resident Geologist's area was very high in 1983 despite the economic recession. The success of a few junior mining companies in the Hemlo area stimulated the speculative stock market and benefited mining exploration programs including many in the Timmins area.

The Swayze "Greenstone Belt" received much attention in 1983. Activity there was probably higher than at any time since the gold boom in the 1930s.

The Detour Lake area also had a large amount of activity. Both major and junior exploration companies carried out extensive exploration programs on properties surrounding the new Detour Lake Gold Mine. The new access road to the mine site will definitely stimulate future exploration activity in this area. Exploration activity increased significantly from last year in the Abitibi "Greenstone Belt". As in the previous 3 years, emphasis was placed on exploration for gold deposits, with a few of the larger companies exploring for base-metal deposits. Some of the projects carried out in the Timmins Resident Geologist's area during 1983 are briefly described here.

Kidd Creek Mines Limited had the most aggressive exploration program in the Timmins area in 1983. Kidd Creek Mines Limited's efforts were mostly concentrated on base-metal programs within easy transportation distance of the company's metallurgical site. Some success was achieved on the property optioned from Chance Mining and Exploration Company Limited. Drill intersections of lead-zinc-silver mineralization were reported in 1983 on a follow-up program to a discovery made by Kidd Creek Mines Limited in 1977. Further exploration and evaluation of this deposit will be done in 1984. Kidd Creek Mines Limited drilled a number of holes in their total base-metal exploration program which includes: 20 holes (6700 m) in Kidd Township, 10 (2595 m) in Prosser Township, 2 holes (811 m) in Carnegie Township, 2 holes (1150 m) in Jamieson Township, 2 holes (469 m) in Reid Township, 2 holes (383 m) in Jessop Township, 4 holes (550 m) in Godfrey Township, and 1 hole (200 m) in Wilke Township.

Base-metal exploratory drilling for their regional program included 4 holes (514 m) in Cunningham Township and 3 holes (548 m) in Yeo Township. Overburden drilling for base-metal exploration was done in Kidd and Lennox Townships.

Kidd Creek Mines Limited's gold exploration program included overburden drilling in Ogden, Hoyle, Matheson, Whitney, Wark, Prosser, and Tully Townships. There were 4 diamond-drill holes (1008 m) drilled in Matheson Township and 4 holes (1098 m) drilled in Whitney Township. Kidd Creek Mines Limited plans to continue the same rate of activity in the Timmins area in 1984 (Kidd Creek Mines Limited, personal communication, 1983).

Noranda Exploration Company Limited had an ambitious program in the Timmins area in 1983. A gold exploration program has been started in Greenlaw Township centred around the old Hotstone Gold Property on which Noranda did some stripping and sampling. A geophysical survey was completed on all of Noranda's property in the area. Two diamond-drill holes were also drilled in Greenlaw Township for base-metal exploration. Noranda drilled 3 diamond-drill holes (1216 feet) for gold exploration purposes in McArthur Township. Green carbonate rock with pyrite mineralization and minor gold values were intersected. The option on the property was dropped. Seven holes (2937 feet) were drilled on an old Mining Corporation gold prospect in Sewell Township. Stripping and sampling was also done. Narrow quartz veining with marginal gold values were outlined. Noranda plans to further explore the prospect in 1984 and remove some material for bulk sampling. Noranda drilled 1 hole on their Detour Lake Property, approximately 5 km southeast of the Detour Mine site. A geophysical anomaly was the target. Graphite with no economic mineralization was intersected. One hole was also drilled in Carnegie Township on a geophysical target. Nothing of significance was intersected and the conductor was not explained. Noranda drilled an 1100-foot hole into the Ontario Geological Survey's test range in Thomas Township. Graphite and pyrite were intersected with no economical mineralization. Noranda optioned various properties from Canamax Re-

TABLE 2 EXPLORATION ACTIVITY DURING THE YEAR

| Number on Figure | Individual or Company | Location | Activity |
|---|---|---|---|
| 1. | 508825 Ontario Ltd | Tisdale Twp. | Manual Labour,stripping. |
| 2. | Asarco Inc | Cody,Macklem Twps. | Diamond drilling |
| 3. | R.Arsenault Property | Slack Twp. | Manual labour |
| 4. | Augdome Corp. Ltd. | Tisdale Twp. | Underground diamond drilling |
| 5. | Canreos Minerals (1980) Ltd. | Brackin,Leeson Twps | Exploration program on Brominco Mines property. |
| 6. | Brown Mcdade Resources (Hollinger Argus) | Denton Twp. | Diamond drilling |
| 7. | Bruneau Mining Corp | Stock,German Twps | Ground surveys |
| 8. | Camchib Resources Inc | Martison Lake Property | Drilling,Metallurgical Testing |
| 9. | Canamax Resources Inc | Byng,Puskuta Legge Twps | Diamond drilling |
| | | Hoyle,Murphy | Diamond drilling, Geological,Geophysical Surveys |
| 10. | Canico Ltd | Benton,Esther Twps | Diamond drilling |
| 11. | Carlson Mines Ltd | Rollo Twp | Geological mapping, Sampling,assays |
| 12. | Cleyo Resources Ltd | Carscallen Twp | Geologicel mapping, Geophysical surveys |
| 13. | Colby Resources Corp | Detour Lake Area | Geophysical surveys |
| 14. | Cominco Ltd | German Twp | Overburden drilling |
| | | Stock Twp | Overburden drilling, Diamond drilling |
| 15. | Comstate Resources | Deloro Twp | Geological mapping, Assays |
| 16. | Currie Copper Ltd | Detour Lake, West of Detour Lake Areas | Geophysical surveys |
| 17. | Dejour Mines Ltd | Cunningham Twp | Geophysical surveys |
| 18. | Dome Exploration | Hopper Lake Area | Diamond Drilling |
| | | Macklem Twp | Diamond Drilling |
| | | Marion,Thomas Twps | Diamond drilling |
| | | Sunday Lake Area | Diamond drilling |
| 19. | East-West Resources | Detour Lake Area | Geological,Geophysical Surveys |
| 20. | E. Fournier | Larkin Twp | Diamond drilling |
| 21. | Getty Mines Ltd | Atkinson Lake, Detour Lake | Diamond drilling |
| 22. | Genesis Resources Corp. | Hopper Lake Area | Geophysical surveys |
| 23. | Global Energy Corp | W.Sunday Lake Area | Diamond drilling |
| | | Detour Lake Area | Diamond drilling |
| 24. | Goldeidt Explorations Ltd. | Bond,Macklem Twps. | Overburden Drilling |
| 25. | Gowest Amalgamated Resources Ltd | Adanac,Agate Homuth,Hurdman Twps. | Diamond drilling |
| 26. | Gulf Minerals Canada | Geary, Loveland, Thorburn Twps | Airbourne and Ground Geophysical Surveys |
| 27. | B.S.Haavaldsrud | Woolrich Twp. | Diamond Drilling |
| 28. | Hanson Mineral Expl | Chester Twp. | Diamond Drilling |
| 29. | Hargor Resources Inc | Champagne Twp. Osway Twp. | Diamond Drilling |

TABLE 2 Continued

| Number on Figure | Individual or Company | Location | Activity |
|---|---|---|---|
| 30. | Hollinger Argus | Denton Twp. | Diamond Drilling |
| | | Tisdale Twp. | Geophysical Surveys |
| 31. | Jarvis Resources | Groves,Chester St.Louis Twps. | Mechanical Equipment<br>Diamond Drilling |
| 32. | H.Keller | Tisdale Twp. | Diamond Drilling |
| 33. | Kenar Reources Ltd. | Lower Detour Lake Area | Geophysical Surveys |
| 34. | Kenty Resources | Swayze Twp. | Geological Mapping |
| 35. | Kidd Creek Mines Ltd. | Blamey Twp. | Geophysical Surveys |
| | | Carnegie Twp. | Diamond Drilling |
| | | Denton,Bristol Thorneloe, Chester Twps. | Diamond Drilling |
| | | Garnet Twp. | Geophysical Surveys |
| | | Jamieson Twp. | Geological Mapping, Geophysical Surveys, Diamond Drilling, Stripping,Mechanical Equipment. |
| | | Kidd Twp. | Diamond Drilling, Geophysical Surveys, Stripping. |
| | | Matheson Twp. | Diamond Drilling |
| | | Ogden Twp. | Sonic Drilling |
| | | Reid Twp. | Diamond Drilling |
| | | Tooms Twp. | Geophysical Surveys |
| | | Whitney Twp. | Diamond Drilling, Geophysical Surveys |
| 36. | M.G.Labelle | Hopper Lake West Sunday, Areas | Geological Mapping, Mechanical Equipment |
| 37. | Lacana Mining Corp | Carnegie , Crockett, Raney Twps. | Geophysical Surveys<br>Geological Mapping |
| | | Rollo Twp. | Geophysical Surveys, Diamond Drilling |
| 38. | L.Lapierre | Sewell Twp. | Stripping |
| 39. | Mercier Explorations Inc. | Langmuir, Fallon Twps | Geophysical Surveys |
| 40. | R.S.Middleton | Whitney Twp. | Geological Mapping, Geophysical Surveys |
| 41. | C.Morgan | Robb Twp. | Manual Labour,Stripping |
| 42. | Murgold Resources Inc. | Benneweis, Chester Twps. | Trenching,sampling, Geophysical Surveys, Re-logging Drill Core |
| 43. | Nahanni Mines Ltd. | Clergue Twp. | Diamond Drilling |
| 44. | Newmont Exploration | Duff,Tully Twps. | Diamond Drilling, Assays |
| | with Trojan Resources | Hopper Lake Area | Diamond Drilling |
| 45. | Noranda Exploration | Carnegie Twp. | Diamond Drilling |
| 46. | Northern Energy Corp | Hopper Lake Area | Diamond Drilling |
| 47. | Northgate Exploration | Fripp Twp. | Exploration Program |
| 48. | Ontario Energy Corp | Smoky Falls | Overburden Drilling, Down hole Geophysics |
| 49. | Omab Enterprises | West Sunday Lake,Hopper Lake Areas | Diamond Drilling |
| 50. | Osway Resources | Osway Twp. | Diamond Drilling, Geological Mapping, Trenching,Geochemistry |
| 51. | Pamour Porcupine Mines | Cody Twp. | Diamond Drilling |
| 52. | Placer Development Co. | Deloro Twp. | Diamond Drilling |
| 53. | D.R.Pyke | Thorneloe Twp. | Diamond Drilling |
| 54. | Quinterra Resources Inc. | Tooms, Greenlaw Twps. | Diamond Drilling, Trenching,Geological Mapping |
| 55. | Rio Alto Explorations Ltd. | Hoyle Twps. | Diamond Drilling |
| 56. | St.Gelais | Deloro Twp. | Diamond Drilling |
| 57. | St.Joe Canada Inc. | Evelyn, Matheson Twps. | Diamond Drilling, Geophysical Surveys |

TABLE 2 Continued

| Number on Figure | Individual or Company | Location | Activity |
|---|---|---|---|
| 58. | Selco Inc | Valentine Twp. | Geophysical Surveys |
| 59. | Tanglewood Consolidated Resources Ltd. | Lizar Twp. | Geological Mapping Trenching |
| 60. | Thor Resources | Groves Twp. | Geophysical Surveys |
| 61. | R.Tremblay | Sewell Twp. | Manual Labour |
| 62. | J.R.Young | Dublin Twp. | Manual Labour |
| 63. | Vedron Ltd. | Tisdale Twp. | Diamond Drilling |
| 64. | Wabigoon Resources | Whitney Twp. | Stripping |
| 65. | Westmin Resources Ltd | Detour Lake Area | Diamond Drilling |
| | | Bond Twp. | Diamond Drilling |
| 66. | Widowczyk,R.J. | Horwood Twp. | Stripping,Manual Labour |

sources Incorporated. Eight holes were drilled on geophysical targets on one of these properties in the Fire River area which encompasses Minnipuka, Walls, Byng, and Puskuta Townships. Graphite and barren sulphides were intersected containing no economical mineralization. Geophysical interpretation and minor reconnaissance exploration was done by Noranda on Canamax Resources Incorporated's holdings in Deloro and Ogden Townships. A major drill program is planned there in 1984 (Noranda Exploration Company Limited, personal communication, 1983).

Cominco Limited once again had a very active exploration program in the Timmins area, spending over $800 000 in 1983. The company flew an INPUT survey over Evelyn Township, conducted ground geophysical programs in Matheson, Gowan, and Evelyn Townships, drilled 200 overburden drillholes in Stock, German, Matheson, Gowan, Evelyn, Tully, Wark, and Jessop Townships, and diamond drilled 4 holes (8000 feet) in Evelyn Township, 2 holes (2000 feet) in Fasken Township, and 2 holes (1000 feet) in Gowan Township (Cominco Limited, personal communication, 1983).

Actively exploring for gold, Dome Exploration (Canada) Limited, drilled in Macklem and Keith Townships. Drilling was also done in Newton, Coppell, and Dale Townships in the Swayze area on various targets outlined in 1982. These 3 townships are held under option from Algoma-Talisman Minerals Limited. Drilling was also done on the company's properties in the Detour Lake area close to the Detour Lake Joint Venture mine site (Dome Exploration (Canada) Limited, personal communication, 1983).

Chevron Canada Resources Limited opened an exploration office in Timmins in 1983. The company will be developing an ambitious program for both base-metal and precious metal exploration in the Timmins area. Presently, the company is accumulating properties and negotiating joint venture programs (Chevron Canada Resources Limited, personal communication, 1983).

Newmont Exploration Limited, in a joint venture with DuPont of Canada Exploration Limited, had 3 major exploration programs in the Porcupine Mining Division. The companies acquired a large piece of ground from various companies and individuals including the McIntyre Mines Limited holdings and the Broulan Resources Incorporated holdings between the old Coniaurum Mine in Tisdale Township and the Pamour Mine in Whitney Township. A large program of geophysics and geological mapping was carried out in 1983. Stripping and trenching was carried out in 3 locations: just east of Broulan Mine in Whitney Township, close to the Davidson Tisdale Property in Tisdale Township, and near the Coniaurum boundary in Tisdale Township. Three holes were drilled in late 1983. A large drill program will be completed on the property in 1984. Twelve diamond-drill holes were drilled in Tully Township in the winter and spring of 1983. A few minor gold intersections were obtained. Three additional holes are planned in 1984. Six diamond-drill holes were drilled in the winter of 1983 in the Hopper Lake area. Exploration focused on locating the extension of the Detour Lake Gold Mine horizon. Results were negative (Newmont Exploration Limited, personal communication, 1983).

Westmin Resources Limited was actively exploring in the Detour Lake area in 1983. The company drilled 8 diamond-drill holes on their Lower Detour Lake Property and 1 on their Nash Creek Property. Geophysical conductors were the targets. Massive pyrite and pyrrhotite and occasional graphitic zones were intersected with some containing anomalous geochemical gold values. Westmin Resources Limited also drilled 2 holes for their gold exploration program in Bond Township. No economic mineralization was intersected (Westmin Resources Limited, personal communication, 1983).

Canadian Nickel Company Limited (Canico), a wholly owned subsidiary of INCO Limited, obtained an option on the old Burton Gold Property in Esther Township. Line cutting, geological, and geophysical surveys including

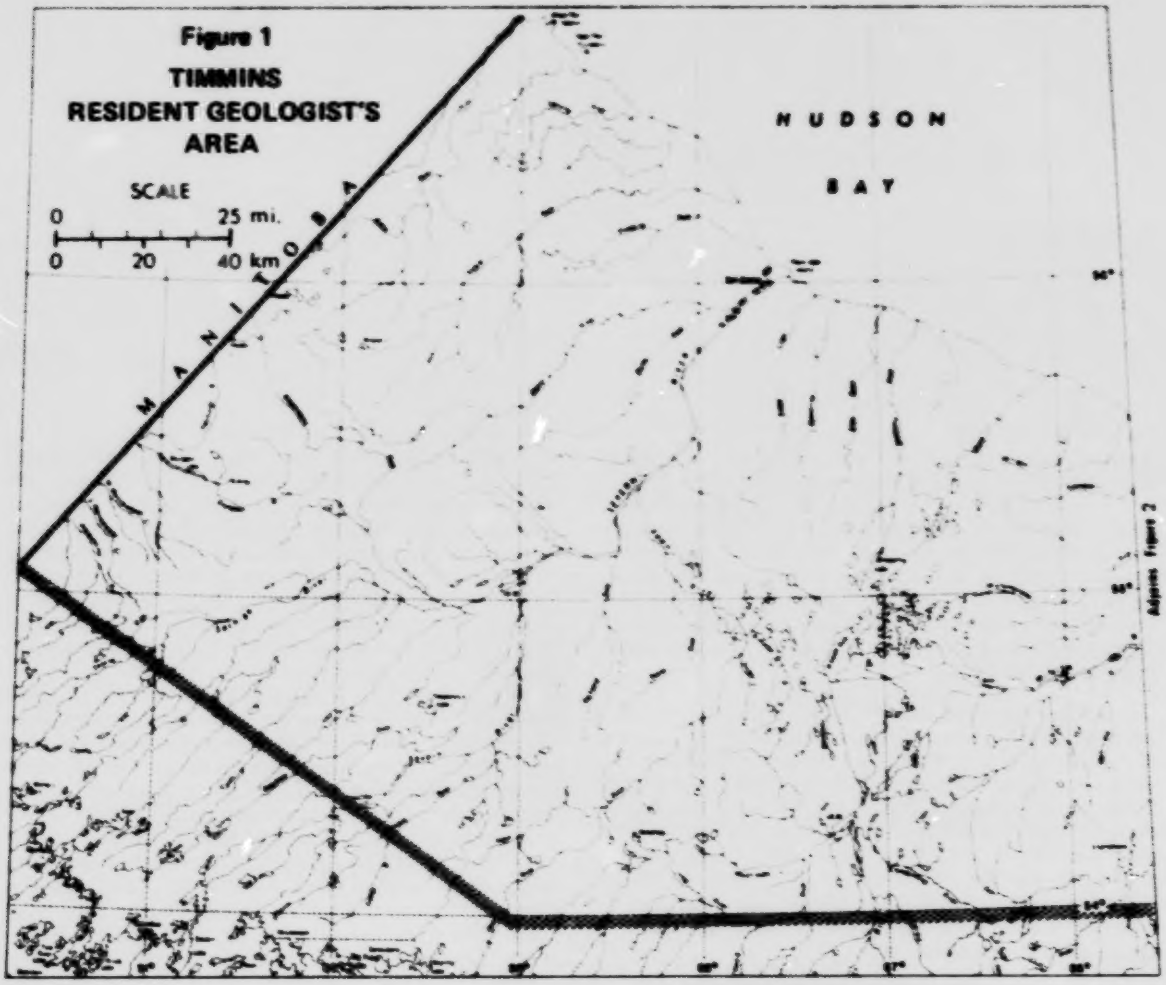


Figure 1

TIMMINS RESIDENT GEOLOGIST'S AREA

SCALE
0
25 mi.
0
20
40 km
MANITOBA
HUDSON BAY
Adjoins Figure 2

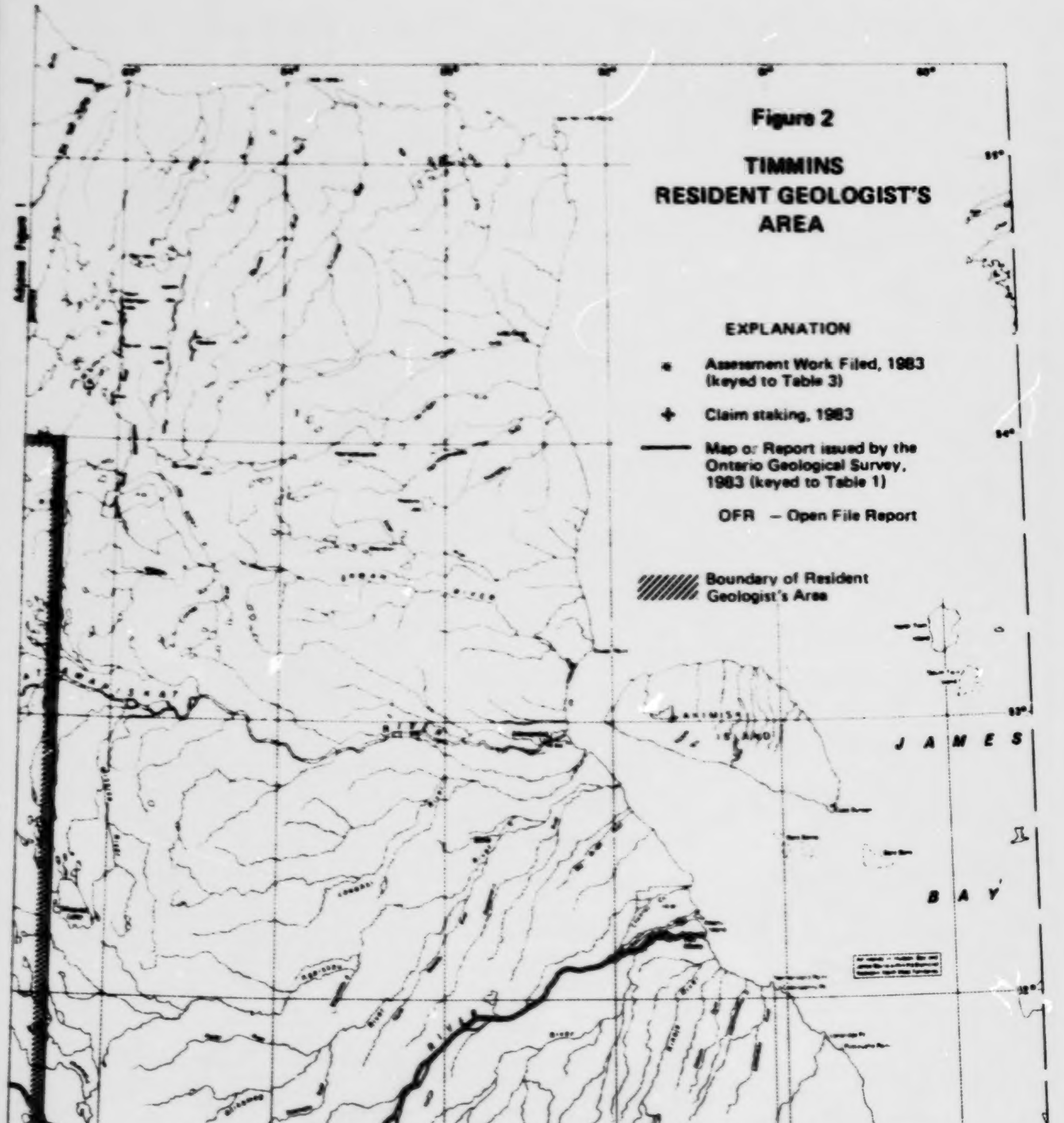


Figure 2

TIMMINS RESIDENT GEOLOGIST'S AREA

EXPLANATION
• Assessment Work Filed, 1983 (keyed to Table 3)
+ Claim staking, 1983
— Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 1)
OFR – Open File Report
▨ Boundary of Resident Geologist's Area
Adjoins Figure 1
JAMES BAY
AKIMISKI ISLAND
ALBANY RIVER
OFR 5453
OFR 5453
OFR 5453
OFR 5453
OFR 5453
QUEBEC
COCHRANE

Adjoins Figures 3 and 4

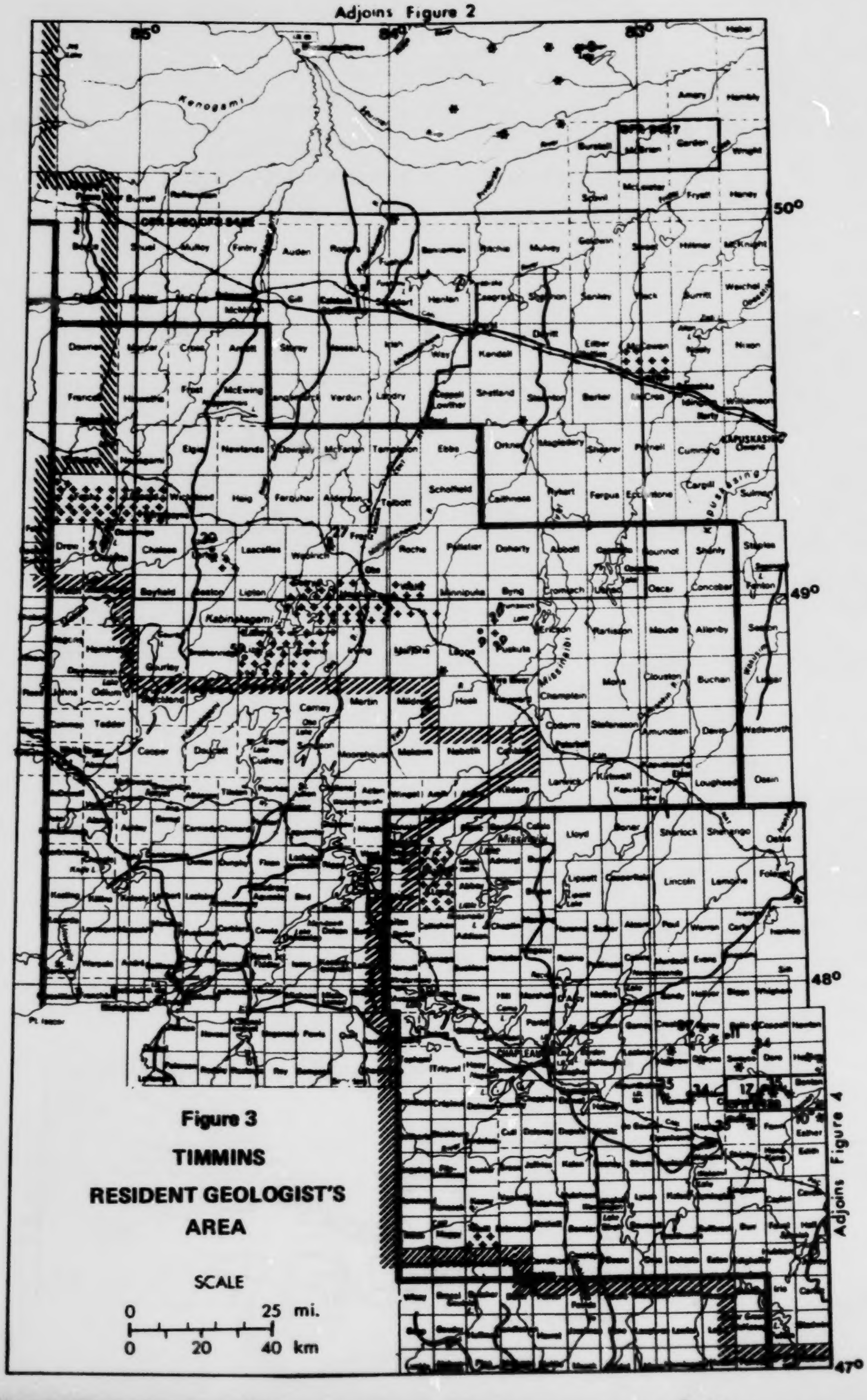

Adjoins Figure 2
85°
84°
83°
50°
49°
48°
47°
Kenogami
KAPUSKASING
CHAPLEAU
Kabinakagami
Mississagi
Auden
Kendall
Shetland
Barker
Cumming
Ebbs
Schofield
Talbott
Lascelles
Roche
Doherty
Abbott
Bournot
Staples
Boyfield
Lipton
Minnipuka
Byng
Cromlech
Oscar
Concober
Erickson
Maude
Alanby
Gourlay
Champlain
Clouston
Buchan
Tedder
Carney
Martin
Hook
Amundsen
Wadsworth
Cooper
Nebotik
Lareck
Loughead
Oban
Lloyd
Sherlock
Shenango
Lincoln
Lamoyne
Paul
Warren
Haig
Elgie
Newlands
Farquhar
Alderson
Fergus
Caithness
Verdun
Landry
Tarbutt
Adjoins Figure 4

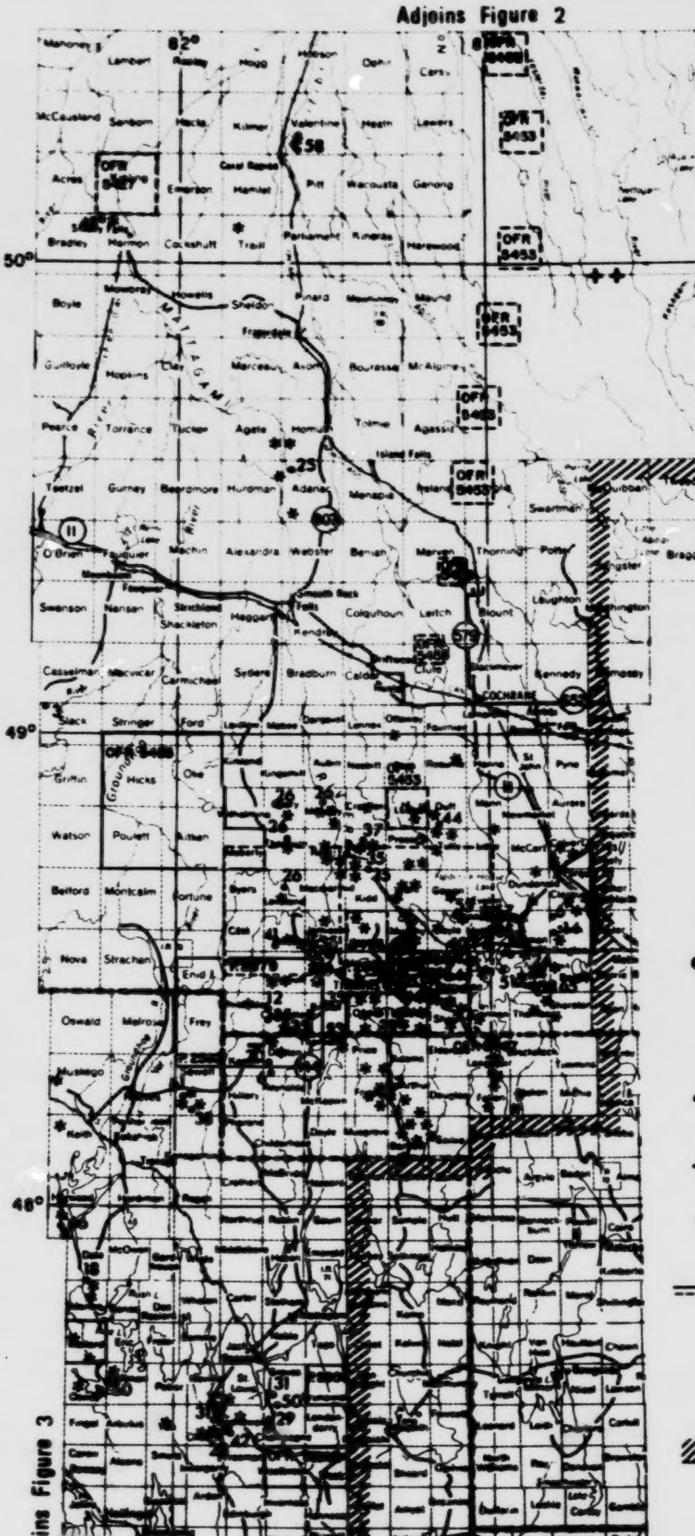
Figure 3

TIMMINS

RESIDENT GEOLOGIST'S

AREA

SCALE
0
25 mi.
0
20
40 km


Adjoins Figure 2
82°
80°
50°
49°
48°
47°
Adjoins Figure 3
Cochrane
Timmins
OFR 5453
SUDBURY

## Figure 4

## TIMMINS RESIDENT GEOLOGIST'S AREA

### EXPLANATION

● Producing Mines, 1983

1. Amoco Canadian Petroleum Co. Ltd., Campbell Red Lake Mines Ltd. – Detour Lake Mine. . . . . . . . . . . . . . Au, Cu

• Exploration activity, 1983 (keyed to Table 2)

✚ Claim staking, 1983

* Assessment Work Filed, 1983 (keyed to Table 3)

---- Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 1)

P. – Preliminary Map
OFR – Open File Report

▨ Boundary of Resident Geologist's Area

SCALE

0 25 mi.
0 20 40 km

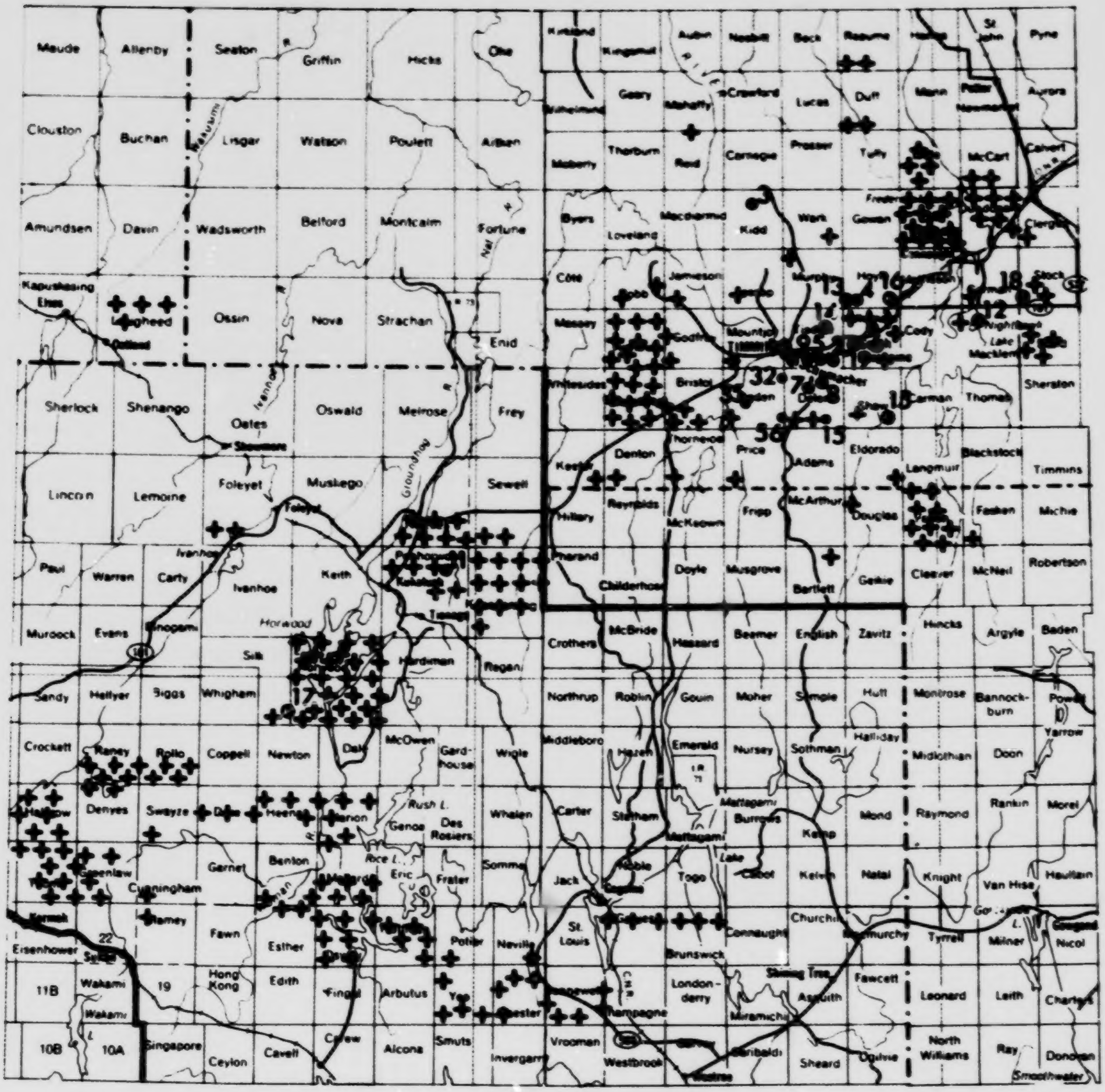

Maude
Allenby
Seaton
Griffin
Hicks
Ohe
Clouston
Buchan
Lisgar
Watson
Poulett
Aitken
Amundsen
Davin
Wadsworth
Belford
Montcalm
Fortune
Kapuskasing
Elms
Lougheed
Ossin
Nova
Strachan
Enid
Sherlock
Shenango
Oates
Oswald
Melrose
Frey
Lincoln
Lemoine
Foleyet
Muskego
Groundhog
Sewell
Paul
Warren
Carty
Ivanhoe
Keith
Murdock
Evans
Horwood
Silk
Hardiman
Regan
Sandy
Hellyer
Biggs
Whigham
Crockett
Raney
Rollo
Coppell
Newton
McOwen
Gardhouse
Wigle
Denyes
Swayze
Heenan
Rush L.
Genoa
Des Rosiers
Whalen
Garnet
Benton
Rice L.
Eric
Frater
Somme
Greenlaw
Cunningham
Fawn
Esther
Potier
Neville
Eisenhower
22
11B
Wakami
19
Hong Kong
Edith
Fingal
Arbutus
Yeo
Chester
10B
10A
Singapore
Ceylon
Cavell
Chew
Alcona
Smuts
Invergarry
Kingsmill
Aubin
Nesbitt
Beck
Reaume
St John
Pyne
Wilhelmina
Geary
Mahaffy
Crawford
Lucas
Duff
Mann
Aurora
Moberly
Thorburn
Reid
Carnegie
Prosser
Tully
McCart
Calvert
Byers
Loveland
Macdiarmid
Kidd
Wark
Gowan
Clergue
Cote
Jamieson
Stock
Massey
Robb
Godfrey
Mountjoy
Cody
Whitesides
Bristol
Ogden
Shaw
Carman
Thomas
Sheraton
Thorneloe
Denton
Price
Adams
Eldorado
Langmuir
Blackstock
Timmins
Keefer
Reynolds
Fripp
McArthur
Douglas
Fasken
Michie
Hillary
McKeown
Doyle
Musgrove
Bartlett
Geikie
Cleaver
McNeil
Robertson
Childerhose
Crothers
McBride
Hassard
Beemer
English
Zavitz
Hincks
Argyle
Baden
Northrup
Robin
Gouin
Moher
Semple
Hutt
Montrose
Bannockburn
Yarrow
Middleboro
Hazen
Emerald
Nursey
Sothman
Halliday
Midlothian
Doon
Carter
Stetham
Mattagami
Burrows
Kemp
Mond
Raymond
Rankin
Morel
Jack
Noble
Togo
Cabot
Kelvin
Natal
Knight
Van Hise
Haultain
St. Louis
Connaught
Churchill
Tyrrell
Milner
Nicol
Brunswick
London-derry
Asquith
Fawcett
Leonard
Leith
Charters
Vrooman
Westbrook
Sheard
Ogilvie
North Williams
Ray
Donovan
Smoothwater
32
36
15
13
14
16
18
12
17

Figure 5

● Producing, Mines, 1983
2. Dome Mines Ltd. – Dome Mine. . . . . . . . . . Au
3. Kidd Creek Mines Ltd. –
Kidd Creek Mine . . . . . . . . . . . . . Cu, Zn, As
Pb, Cd, Sn
4. Kidd Creek Mines Ltd. – Owl Creek Mine . . . . Au

Pamour Porcupine Mines Ltd. (5 – 10)
5. Carium Property . . . . . . . . . . . Au, Cu, Mo
6. No. 1 Property . . . . . . . . . . . . . Au, As
7. No. 3 Property . . . . . . . . . . . . . Au, As
8. Romfield Property . . . . . . . . . . . Au, As
9. Schumacher Property. . . . . . . . . . Au, As, Cu
10. Timmins Property. . . . . . . . . . . . . Au, As
11. Steetley Talc Ltd. – Penhorwood Mine . . . . talc

◐ Mines and/or Properties under Development
12. Asarco Exploration of Canada Ltd.
Aquarius Property . . . . . . . . . . . . . . . . Au
13. Canamax Resources Inc. – Hoyle Twp. . . . . . Au
14. Davidson Tisdale Mines Ltd. – Tisdale Twp. . . . Au
15. Gail Resources Ltd. – Shaw Twp. . . . . . . . . Au
16. Kidd Creek Mines Ltd. –
Hoyle Pond Property . . . . . . . . . . . . . . . Au
17. Northgate Exploration – Orofino Mines Ltd. . . Au
18. St. Andrew's Goldfields – Stock Twp. . . . . . . Au
19. Wabisoon Resources Ld. – Whitney Twp. . . . . Au

✚ Claim staking, 1983

• Exploration activity, 1983 (keyed to Table 2)

TABLE 3

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

AMag,AEM - Airbourne Magnetometer,Airbourne Electromagnetic Survey
Au - Gold
BM - Base Metals
Cu - Copper
DD - Diamond Drilling
GL - Geological Surveys
GC - Geochemical Surveys
HEM - Horizontal Loop Electromagnetic Survey
IP - Induced Polarization Survey
Mag - Magnetometer Survey
OVD - Overburden Drilling
Res - Resistivity Survey
Ttr - Trenching
Str - Stripping

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Agate,Nemuth, | 42H/12 | Gowest Amalgamated | Pb,Zn,Ag | Assess. | Mag,EM | 1982 | 2.5496 | T-2582 |
| Adanac,Hurdman | | Resources L | | N.Assess. | DD-2-351 m | 1983 | | T-2582 |
| Atkinson Lake Area | 32E/13 | Abitibi Price Inc. | Au | Assess. | GL,EM,Mag | 1981 | 2.4480 | T-2514 |
| | | | | | | 1982 | | |
| Atkinson Lake, | 32E/13E | Getty Mines Ltd. | Au | Assess. | DD-14-2390 m | 1983 | ------ | T-2443 |
| Lower Detour Lake | | | | | | | | |
| Atkinson Lake Area | 32E/13SE | Hudbay Mining L | Au | Assess. | DD-2-170 m | 1982 | ------ | T-2391 |
| Bartlett,Geike, | 42A/3NE | Noranda Expl. Co.L | | Assess. | DD-4-1350 m | 1982 | ------ | T-2492 |
| McArthur Twps. | | | | | | | | |
| Bartlett Twp. | 42A/3W | Canamax Resources | | Assess. | GL | 1982 | 2.5173 | T-2416 |
| | | Inc. | | | | 1982 | 2.5170 | T-2416 |
| | | | | | | 1982 | 2.5224 | T-2416 |
| | | | | | GL | 1982 | 2.5171 | T-2416 |
| Benneweiss Twp. | 41P/12SE | E.Blanchard Property | Au | Assess. | Mech. | 1982 | ------ | T-2475 |
| | 42P/12SW | National Irron Res | Au | Assess. | GL | 1981 | 2.5258 | T-2476 |
| Blamey Twp. | 41O/10NE | Kidd Creek Mines L | Au | Assess. | Mag,HEM | 1983 | 2.5562 | T-2577 |
| Blamey Twp. | 41O/10NE | Noranda Expl Co L | Au | Assess. | Mag,HEM | 1982 | 2.5530 | T-2564 |
| Bond Twp., | 42A/7NW | Goldeidt Expl.L | Au | Assess. | OVD-35-1610 m | 1982 | ------- | T-2533 |
| Macklem Twp. | | | | | Mag,HEM | 1981 | 2.4499 | T-2533 |
| | | | | | EM,Mag,Vlf | 1982 | 2.5429 | T-2533 |
| Bond Twp. | 42A/7NE | Westmin Resources L | Au | Assess. | DD-2-496 m, | 1982 | ------ | T-2440 |
| | | | | | assays | | | |
| | | | | | OVD-61-1794 m | 1982 | 2.5123 | |
| Bristol Twp | 42A/5,6 | Kidd Creek Mines L | | Assess. | AEM,AMag | 1981 | 2.4323 | T-1961 |
| Burstall Twp. W, | 42J/3NW | Selco Inc | diamonds | Assess. | Mag | 1982 | 2.5013 | T-2528 |
| N.Pivabiska R. | | | | | | | | |
| Byng,Puskuta | 42B/13NE | Canamax Resources | | Assess. | DD-6-455 m | 1983 | ------ | T-2473 |
| Legge Twps | | Inc. | | | | | | |
| Byrnes Lake Area | 42J/5SE | Selco Inc. | diamond | Assess. | Mag,HEM | 1982 | ------ | T-2319 |
| Calvert Twp., | 42A/10NE | Canamax Resources | | Assess. | GL | 1981 | 2.4759 | T-2356 |
| Clergue Twp. | | Inc. | | | | 1981 | 2.4769 | T-2356 |
| | | | | | | 1981 | 2.4772 | T-2356 |
| Calvert Twp., | 42A/10NE | Canamax Resources | | Assess. | GL | 1981 | 2.4775 | T-2356 |
| Clergue Twp. | | Inc. | | | | | 2.4760 | |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2.4778 | |
| | | | | | | | 2.4777 | |
| | | | | | | | 2.4775 | |
| | | | | Assess. | DD-3-335 m | 1982 | ------ | |
| Carscallen Twp | 42A/5 | Gold Shield Synd | | Assess. | Mag,HEM | 1982 | 2.4993 | T-1926 |
| Carman,Eldorado, Langmuir,Shaw Twp. | 42A/6SE | Rio Tinto Canada L | | Assess. | Mag,VLF | 1982 | 2.4575 | T-2456 |
| Carnegie Twp. | 42A/11NW | Kidd Creek Mines L | | Assess. | AEM | 1980 | 2.3565 | T-1872 |
| | | | | | DD-2-358 m | 1983 | ------ | |
| Carnegie Twp. | 42A/14SW | Noranda Expl | | Assess. | DD-1-150 m | 1983 | ------- | T-2353 |
| Carnegie,Prosser, Tully,Kidd,Wark, Gowan Twps | 42A/11SW | D.R.Pyke Property | | Assess. | Amag | 1981 | 2.4858 | T-2490 |
| Chabbie Lake Area | 32E/12S | Hudbay Mining L | | Assess. | DD-2-247 m | 1982 | ------ | T-2390 |
| Champagne Twp. | 41P/12SW | Margor Resources L | Au | Assess. | De-Water shaft Str,Gl,mech | 1981 | ----- | T-2357 |
| Chester Twp. | 41P/12SW | Hanson Minerals | | Assess. | GL,VLF | 1981 | 2.4651 | T-1969 |
| | | Expl.L | | | Assays | 1981 | 2.5186 | T-1934 |
| | | (L.H.Lytle Property) | | | DD-1-30 m | 1983 | ------ | T-1934 |
| Chester Twp. | 41O/10NE | Kidd Creek Mines L | Au | Assess. | DD-2-265 m | 1983 | ------ | T-2512 |
| Blamey,Greenlaw, Cunningham Twps. | | | | | Mag,Vlf,HEM | 1982 | 2.5403 | T-2412 |
| Chester Twp. | 41P/12SW | Murgold Resources L | Au | Assess. | Assays,str | 1981 | 2.5038 | T-2433 |
| Chester,Benneweis, St.Louis Twps. | 41P/12SW | Murgold Resources L | Au | Assess. | GL | 1981 | 2.4889 | T-2433 |
| Chester,Yeo Twps | 41P/12SW | Johnway Resources I | Au | Assess. | str | 1981 | ------ | T-2383 |
| Clergue Twp. | 42A/10NE | Canamax Resources Inc. | | Assess. | GL | 1982 | 2.4776<br>2.4773 | T-2356 |
| Clergue Twp. | 42A/10NW | Ingex Holdings & Development L | | Assess. | Vlf | 1981 | 2.4173 | T-2537 |
| Clergue Twp. | 42A/10SE | Surveymin L | Au | Assess. | assays | 1981 | 2.4743 | T-2330 |
| and Stock Twp. | | | | | GL | 1982 | 2.5079 | |
| Cochrane Twp. | 41O/14NW | Kapuskasing Res | | Assess. | GL,Mag,VLF, | 1982 | 2.5183 | T-2549 |
| Cody , Matheson Twps. | 42A/10SW | Placer Development | Au | Assess. | mag | 1982 | 2.4756 | T-2375 |
| Cody Twp. | 42A/11SE | Comstate | Au | Assess. | HEM,Vlf | 1982 | 2.5109 | T-2374 |
| Cody Twp. | 42A/10SW | Pamour Porcupine Ms. | Au | Assess. | OVD-6-238 m | 1982 | 2.4721 | T-1573 |
| | | | | | DD-1-198 m | 1983 | ------ | T-1573 |
| Cody Twp. | 42A/11SE | Placer Development L | Au | Assess. | GC | 1981 | 2.4453 | T-2496 |
| Cody Twp. | 42A/10SW | Placer Development | Au | Assess. | Mag | 1982 | 2.4755 | T-2374 |
| | | | | | GL,Mag,VLF | 1982 | 2.5253 | T-2497 |
| Crawford Twp. | 42A/14SW | Home Oil Co L | | Assess. | Mag,HEM | 1982 | 2.4665 | T-2513 |
| | | | | Assess. | EM,Mag | 1981 | 2.4627 | T-2410 |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| | | | | N.Assess. | PEM,Mag | 1981 | 2.4669 | T-2410 |
| Cunningham Twp | 41O/10NE, | DeJour Mines L | Au | Assess. | Mag,HEM | 1983 | 2.5499 | T-2591 |
| Delore Twp. | 42A/6 | Canamax Resources Inc. | Au | Assess. | GC | 1981 | 2.4330 | T-1978 |
| | 42A/6NE | Diepdaume Mines L | Au | Assess. | EM | 1980 | 2.4236 | T-2498 |
| | | | | | | 1981 | | |
| | 42A/6NE | Comstate Resources L | Au | Assess. | Ovd-45-467 m | 1981 | 2.4732 | T-2478 |
| | 42A/6NE | Comstate Resources L | Au | Assess. | Ovd.-24-246 m | 1981 | 2.4734 | T-2480 |
| | | | | | GC | 1981 | 2.4454 | T-2495 |
| | | | | | GC | 1981 | 2.4452 | T-2494 |
| | | | | | GC | 1981 | 2.4450 | T-2502 |
| | | | | | OVD-109-675 m | 1981 | 2.4823 | T-2505 |
| | | | | | DD-1-249.9 m | 1982 | ------ | T-2382 |
| | | | Au | Assess. | GL,assays | 1983 | 2.5727 | T-2420 |
| | 42A/6NW | Pamour Porcupine Mines L | Au | Assess. | Mag | 1982 | 2.4972 | T-2564 |
| | | | | | VLF | 1982 | | T-2564 |
| | 42A/6NW | Placer Development | Au | Assess. | Mag,GL,VLF | 1982 | 2.5051 | T-2554 |
| | 42A/6NW | D.R.Pyke Property | Au | Assess. | Mag,Hem | 1982 | 2.4974 | T-2420 |
| | 42A/6NW | J. St.Gelais Property | Au | Assess. | DD-1-160 m | 1983 | ------ | T-2351 |
| | 42A/6NW | Vatco Expl.Co.L | Au | Assess. | Mag | 1981 | 2.4241 | T-2530 |
| | | | | | Vlf | 1981 | 2.4208 | T-2539 |
| Dent Lake Area | 42J | Selco Inc. | | Assess. | DD-1-115 m | 1980 | ------ | T-2407 |
| Denton Twp. | 42A/5SE | Brown McDade Mines L | Au | Assess. | Vlf,Mag | 1981 | 2.4467 | T-1991 |
| Denton Twp | 42A/5SE | Hollinger Argus L | Au | Assess. | dd-1-806 ft | 1983 | ------- | T-2412 |
| | | | | | GL | 1981 | 2.5663 | T-2412 |
| Denyes Twp. | 41O/15SW | Johns-Manville | Au | Assess. | Mag,HEM | 1981 | 2.4687 | T-2583 |
| Dublin Twp. | 41O/4SE | J.B.Young Property | Au | Assess. | Manual | 1983 | ------ | T-2464 |
| Duff.Tully Twps. | 42A/14SE | Newmont Exploration Co.of Canada L. | | Assess. | GL | 1982 | 2.4735 | T-2451 |
| | | | | Assess. | Assays | 1982 | 2.5097 | |
| | | | | Assess. | Assays | 1982 | 2.5097 | T-2451 |
| | | | | Assess. | Assays | 1983 | 2.5464 | T-2451 |
| | | | | Assess. | DD-1-107 m | 1983 | ------ | T-2404 |
| Duff Twp. | 42A/14SE | Canico | | Assess. | GC,EM | 1982 | 2.5132 | T-1979 |
| Dundonald Twp. | 42A/10NW | Cominco L | | Assess. | UTEM | 1982 | 2.5303 | T-2576 |
| Esther,Benton Twps | 41O/9NW | Canico | Au | Assess. | DD-2-311 m | 1983 | ------ | T-2595 |
| Evelyn,Matheson Twps. | 42A/10, 11 | St. Joe Canada Inc. | | Assess. | DD-6-1134 m | 1982 | ------ | T-2510 |
| | | | | | DD-6-1135 m | 1983 | | |
| | | | | | Mag | 1983 | 2.5029 | T-2510 |
| | | | | | Gradiometer | 1983 | 2.5347 | T-2510 |
| | | | | | GL | 1982 | 2.5591 | T-2510 |
| Fallon Twp. | 42A/7SW | D.Meunier Property | Au | Assess. | rtr | 1982 | ------ | T-2453 |
| Fallon Twp | 42A/7SW | Noranda Expl Co | Au | Assess. | Mag,EM | 1981 | 2.4782 | T-2557 |
| | | | | | | 1982 | 2.4783 | T-2553 |
| Fallon,Fasken Twps | 42A/2NW | Cominco L | Au | Assess. | Mag,HEM | 1982 | 2.5091 | T-2574 |

TABLE 3 Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Fallon,Langmuir Twps. | 42A/6SE | Mercier Expl L | Au | Assess. | Mag,vlf | 1983 | | T-2560 |
| Fauken Twp. | 42A/2NW | Noranda Exploration | | Assess. | Mag,HEM | 1981 | 2.6780 | T-2522 |
| | | | | | | 1981 | 2.6781 | T-2522 |
| Foleyet Twp. | 42B/1NW | Hudbay Mining Co L | | Assess. | DD-4-399 m | 1982 | ------ | T-2430 |
| Foleyet,Cote Twps. | 42A/12SW | Kidd Creek Mines L | | Assess. | Mag,Vlf | 1982 | 2.5232 | T-2548 |
| Fripp Twp. | 42A/3W | Amax Minerals Expl. | | Assess. | GL | 1982 | 2.5160 | T-2416 |
| Fripp,Mcarthur Twps. | 42A/3NW | Mattagami Lake Exploration Co. L | Au | Assess. | IP,Res | 1981 | 2.4435 | T-2511 |
| | | | | | Mag,Vlf | 1982 | 2.5055 | T-2511 |
| | | | | | | | 2.5440 | |
| Fripp,McArthur, Price Twps | 42A/6SW | Northgate Expl. | | Assess. | Mag,GC,GL, | 1982 | 2.5226 | T-2525 |
| | | | | | Vlf,assays | 1981 | 2.4766 | T-2525 |
| | | | | | | | 2.5655 | T-2525 |
| Garnet Twp. | 41O/10NE | Kidd Creek Ms L | | Assess. | Mag,HEM | 1983 | 2.5568 | T-2588 |
| Garnet Twp. | 41O/9NW | Lacana Mining Corp | Au | Assess. | GL,CEM | 1982 | 2.5557 | T-2561 |
| | | | | | | | 2.5558 | |
| Geary,Loveland, Reid,Mahaffy, Thorburn Twps. | 42A/12,13 14 | Gulf Minerals Canada L | | Assess. | AEM,EM,Mag | 1980 | 2.4614 | T-1929 |
| | | | | | | 1983 | 2.4673 | T-2367 |
| German Twp | 42A/10SW | Cominco L | | Assess. | OVD-18-780 m | 1983 | | T-2466 |
| German Twp | 42A/10SW | Goldeidt Explorations | Au | Assess. | Mag,HEM | 1981 | 2.4401 | T-2316 |
| Godfrey Twp. | 42A/5NE | Kidd Creek Mines L | | Assess. | DD-1-170 m | 1982 | ------ | T-1867 |
| Godfrey,Jamieson | 42A/5,12 | Samim Canada Inc. | | Assess. | Mag.,EM | 1981 | 2.4383 | T-1966 |
| | | | | | | 1982 | 2.5247 | |
| | | | | | | 1981 | 2.5248 | |
| | | | | | GL | 1982 | 2.5482,<br>2.5483,<br>2.5484 | |
| Gowan,Hoyle Twps. | 42A/11E | Cominco L | | Assess. | OVD-47-1380 m | 1982 | 2.4837 | T-2414 |
| | | | | | | 1982 | 2.4836 | T-2416 |
| Greenlaw Twp. | 41O/10NW | Hollinger Argus L | | Assess. | DD-2-213 m | 1982 | ------ | T-2484 |
| Halcrow Twp. | 41O/15SW | Gossan Resources L | | N.Assess. | GL | 1981 | 2.3962 | T-2567 |
| Halcrow Twp | 41O/15SW | Sulpetro Minerals L | Au | Assess. | Mag,vlf | 1982 | 2.5190 | T-2472 |
| Harmon Twp. | 42J/1SE | Selco Inc | | Assess. | Mag | 1982 | 2.5370 | T-2558 |
| Hawkins,Walls Twp. | 42G/4 | St. Joseph Expl. | | Assess. | GL | 1980 | 2.4407 | T-1957 |
| Groves Twp. | 41P/12SE | Thor Resources Inc | Au | Assess. | Mag,vlf | 1983 | 2.5421 | T-2572 |
| Groves,St.Louis | | Jarvis Resources L | Au | Assess. | Mech | 1983 | ------ | T-2599 |
| Heenan,Marion, Genoa Twps. | 41O/16 | Falconbridge L | Au | Assess. | GL | 1982 | 2.5183 | T-2345 |
| | | | | | Mag | 1982 | 2.5182 | T-2345 |
| Heenan,Dore, Marion Twps | | Kerr Addison Mines L | Au | Assess. | GL | 1982 | 2.5177 | T-2569 |
| Hopper L.Area, W. Sunday L.,Area | 32E/13NW | Award Resources Prop (held in trust by Ingamar exploration) | Au | Assess. | VLF | 1982 | 2.4720 | T-2503 |
| | | M.J.Labelle Property | Au | Assess. | GL,mech,str | 1982<br>1983 | 2.5207 | T-2571 |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Hopper Lake Area |  | Dome Exploration | Au | Assess. | DD-16-2540 m | 1983 | ------- | T-2392 |
|  |  | Canada L |  |  |  |  |  |  |
|  |  | Genesis Resource Co | Au | Assess. | Mag,Vlf | 1983 | 2.5579 | T-2601 |
| Horwood Twp. | 42B/15W | Goldfields Mining | Au | Assess. | Vlf,Mag | 1982 | 2.4892 | T-2555 |
|  |  | Corp . |  |  |  |  | 2.4890 |  |
| Horwood,Silk twps | 42B/15W | Northgate Expl | ????? | Assess. | VLF | 1981 | 2.4419 | T-2126 |
|  |  |  |  |  | GC | 1982 | 2.4971 | T-2126 |
|  |  |  |  |  | DD-1-150 m | 1983 | ------ | T-2126 |
| Horwood Twp. | 42B/15W | N.Terrell Property | Au | Assess. | EM,Mag,GC,GL | 1981 | 2.4456 | T-2322 |
| Horwood Twp. | 41O/6SW | R.J. Widowczyk | Au | Assess. | Manual,str | 1982 | ______ | T-2424 |
|  |  | Property |  |  |  | 1983 |  |  |
| Hoyle Twp. | 42A/11SE | Kidd Creek Mines L |  | Assess. | DD-1-123m | 1981 | ------ | T-2687 |
| Hoyle Twp. |  | Lost Tag Investment | Au | Assess. | Vlf,Mag | 1982 |  | T-2600 |
| Hoyle,Evelyn. | 42A/10,11 | St. Joe Canada Inc. | Au | Assess. | GL | 1982 | 2.5133 | T-2510 |
| Hoyle,Murphy Twps. | 42A/11 | Rosario Resources |  | Assess. | OVB | 1978 | 2.4434 | T-1928 |
|  |  | Canada L |  |  |  |  |  |  |
|  |  | Canamax Resources |  | Assess. | DD-2-283.5 m | 1982 | ------- | T-1928 |
|  |  | Inc. |  | Assess. | DD-1-141 m | 1983 | ------ | T-1928 |
|  |  |  |  | Assess. | GL | 1982 | 2.5164 | T-1928 |
|  |  |  |  | Assess. | AMag | 1981 | 2.5165 | T-1928 |
| Huffman Twp. | 41O/9NE | Granges Exploration |  | Assess. | DD-3-370 m | 1982 | ------ | T-2519 |
|  |  | AB |  |  |  | 1982 | ------ | T-2519 |
| Jamieson Twp. | 42A/12SE | Kidd Creek Mines L |  | Assess. | DD-1064 m | 1982 | ------ | T-2470 |
|  |  |  |  |  |  | 1983 | ------ | T-2470 |
|  |  |  |  |  | str,mech | 1983 | ------- | T-2470 |
|  | 42A/12SE | Kidd Creek Mines L |  | Assess. | Mag,VLF |  | 2.4880 | T-2543 |
|  |  |  |  | Assess. | DD-2-235 m | 1983 | ------ | T-1867 |
|  |  |  |  | Assess. | str | 1983 | ------ | T-2543 |
| Jamieson Twp. |  | Samim Canada L |  | Assess. | GL | 1982 | 2.4950 | T-2527 |
|  |  |  |  | Assess. | GL | 1982 | 2.4982 | T-2460 |
|  |  |  |  | Assess. | GL | 1982 | 2.5160 | T-2460 |
|  |  |  |  | Assess. | HEM | 1981 | 2.5249 | T-1966 |
|  |  |  |  |  |  | 1983 |  |  |
|  |  |  |  | Assess. | HEM | 1981 | 2.5246 | T-1966 |
|  |  |  |  | Assess. | GL | 1981 | 2.5452 | T-1966 |
|  |  |  |  |  |  | 1983 |  |  |
|  |  |  |  | Assess. | HEM | 1982 | 2.5322 | T-2562 |
| Jessop Twp. | 42A/11SW | Kidd Creek Mines L |  | Assess. | Mag,HEM,str | 1982 | 2.4997 | T-2477 |
| Jessop Twp. | 42A/11SW | Samim Canada L |  | Assess. | GL | 1981 | 2.4569 | T-2415 |
|  |  |  |  | Assess. | DD-2-367 m | 1983 | ------- | T-2415 |
| Keith Twp. | 42B/1NW | Hudbay Mining L |  | Assess. | DD-4-636.6 m | 1982 | ------ | T-2430 |
| Kidd Twp. | 42A/11NW | Kidd Creek Mines L |  | Assess. | OVD-1-55 m | 1982 | 2.5265 | T-823 |
| Larkin Twp. | 42A/6NW | E.Fournier |  | Assess. | DD-1-60 m | 1983 | ------ | T-2593 |

TABLE 3 Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Tisdale Twp. | 42A/13SW | Texaco Canada L |  | Assess. | AMag,AEM | 1982 | 2.4895 | T-2418 |
|  |  |  |  |  |  |  | 2.4896 |  |
| Lower Detour Lake | 32E/13 | Abitibi Price Inc |  | Assess. | GL,EM,Mag | 1981 | 2.4480 | T-2316 |
|  |  |  |  |  |  |  | 2.4481 |  |
| Lower Detour Lake | 32E/13E | Getty Canadian |  | Assess. | Amag,Aem | 1981 | 2.4613 | T-2463 |
|  |  | Minerals L |  |  |  |  |  |  |
| Lower Detour Lake | 32E/13NE | Comar Resources L | Au | Assess. | EM | 1981 | 2.4708 | T-2506 |
|  |  |  |  |  |  | 1982 |  |  |
| Lower Detour Lake | 32E/13NE | Midland Energy L | Au | Assess. | VLF | 1982 | 2.4708 | T-2506 |
| Atkinson Lake Area | 32E,L | Westmin Resources L | Au | Assess. | DD-9-1656 m | 1982 | ------- | T-2331 |
| Lower |  |  |  |  | DVD-13 246 m | 1982 | 2.4933 | T-2331 |
|  |  |  |  |  | Mag | 1982 | 2.5206 | T-2331 |
| Lucas twp. | 42A/14SE | Abitibi Price Inc. |  | Assess. | EM,Mag | 1982 | 2.4650 | T-2496 |
|  |  | Camiro |  | Assess. | Rom,GC | 1982 | 2.5131 | T-1977 |
|  |  | Home Oil Co L |  | S.Assess. | EM,Mag | 1982 | 2.4629 | T-2411 |
|  |  |  |  |  |  |  | 2.4628 |  |
|  |  |  |  | Assess. | EM,Mag | 1981 | 2.4670 | T-2411 |
|  |  |  |  |  |  |  | 2.4666 | T-2411 |
| Macdiarmid Twp. | 42A/11NW | Kidd Creek Mines L |  | Assess. | GL | 1982 |  | T-1869 |
| Macklem,Cody Twps. | 42A/10SW | Asarco Expl. Co. | Au | Assess. | OVD-30-1012 m | 1982 | 2.4685 | T-1959 |
|  |  |  |  |  | Mag | 1982 | 2.4683 | T-1959 |
|  |  |  |  |  | VLF | 1982 | 2.5957 | T-1959 |
|  |  |  |  |  | GC | 1982 | 2.5059 | T-1959 |
|  |  |  |  |  | Mag,VLF,HEm | 1982 | 2.4684 | T-1959 |
|  |  |  |  |  | DD-1-975 m | 1983 | ----- | T-1959 |
| Macklem,Thomas | 42A/7 | Dome Expl | Au | Assess. | DD-7-1090 m | 1983 | ----- | T-2402 |
| Twps. |  |  |  |  |  |  |  |  |
| Macklem Twp. | 42A/10SW | Pamour Porcupine | Au | Assess. | Mag,Vlf | 1981 | 2.4678 | T-2313 |
|  |  | Mines L |  |  |  | 1982 | 2.4690 | T-2313 |
|  |  |  |  |  | OVD-11-340 m | 1982 | 2.5113 | T-2313 |
|  |  |  |  |  |  | 1982 | 2.5433 | T-2313 |
| Macklem twp. | 42A/10SW | Placer Development |  | Assess. | DD-3-525 m | 1982 |  | T-2358 |
|  |  | L |  | Assess. | Mag,VLF | 1982 | 2.5046 | T-2358 |
| Macklem Twp. | 42A/7NW | Vatco Exploration | Au | Assess. | Vlf,Mag | 1981 | 2.4224 | T-2536 |
| Mahaffy,Reid Twp. | 42A/13SE | Utah Mines L |  | Assess. | IP,EM | 1982 | 2.4695 | T-1841 |
| Mallard Twp. | 410/9NW | Granges Exploration | Au | Assess. | DD-2-115 m | 1982 | ----- | T-2481 |
|  |  | AB |  |  |  |  |  |  |
|  |  | Canadian Gold And | Au | Assess. | AEM | 1981 | 2.5285 | T-2580 |
|  |  | Metals Inc. |  |  |  |  | 2.4261 | T-2581 |
| Marion Twp. | 410/16S | Dome Expl Co L | Au | Assess. | EM,Mag | 1982 | 2.5447 | T-2587 |
|  |  |  |  |  | DD-3-142 m | 1983 | ----- | T-2587 |
|  |  | Falconbridge L | Au | Assess. | Core samples | 1982 | ______ | T-2345 |
| Matheson Twp. | 42A/11SE | Asarco Expl Co L | Au | Assess. | HEM,Gl | 1981 | 2.4482 | T-1967 |
|  |  |  |  |  |  | 1982 | 2.5056 | T-1967 |
|  |  |  |  |  |  | 1982 | 2.5280 | T-1967 |
| Matheson Twp. | 42A/10SW | Goldsidt Expl L |  | Assess. | HEM,Mag | 1981 | 2.4400 | T-2499 |
| Matheson Twp. | 42A/9 | Kidd Creek Mines L |  | Assess. | AEM, Amag | 1981 | 2.4801 | T-541 |

TABLE 3 Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| | | | | | DD-1-122 m | 1983 | ------ | T-561 |
| | | Kidd Creek Mines L | | Assess. | Mag,hem | 1981 | ------ | T-2483 |
| | 42A/11N | Kidd Creek Mines L | | Assess. | OVD-7-370 m | 1983 | 2.4692 | T-1984 |
| | | | | | DD-8-1759 m | 1983 | ------ | T-1984 |
| | | | | | OVD-5-198 m | 1982 | 2.4065 | T-1984 |
| | | | | | OVD-6-595 m | 1982 | 2.4967 | T-1984 |
| | | | | | AEM,AMag | 1982 | 2.5230 | T-1984 |
| | | | | | DD-3-126 m | 1983 | ----- | T-1984 |
| McArthur Twp. | 42A/3N | Canamax Resources Inc. | | Assess. | GL | 1982 | 2.5167<br>2.5222<br>2.5223<br>2.5172 | T-2416 |
| McArthur,Bartlett Twps. | 42A/1NE | Noranda Expl Co L | | Assess. | Mag,HEM | 1981 | 2.4619 | T-2492 |
| | | | | | Linecutting | 1982 | | |
| McArthur Twp. | 42A/6NW | Northgate Expl. | | Assess. | Mag | 1982 | | T-2525 |
| Mountjoy Twp. | 42A/11SW | D.R.Pyke Property | | Assess. | OVD-42-721 m | 1981 | 2.4975 | T-2526 |
| | | | | | OVD-16-224 m | 1981 | 2.4976 | T-2526 |
| | | | | | OVD-30-360 m | 1982 | | T-2526 |
| Murphy Twp. | 42A/11S | Canamax Resources Inc. | | Assess. | GL,Mag,VLF | 1982 | 2.4970 | T-2521 |
| | | | | | | 1983 | 2.5454 | T-2563 |
| | | | | | AEM | 1981 | 2.5260 | T-2482 |
| Murphy,Tisdale, Werk,Twps. | 42A/11S | D.R.Pyke Property | | Assess. | AMag | 1981 | 2.4457 | T-2482 |
| Muskego Twp | 42B/8SW | Noranda Expl Co. L | | Assess. | Mag,HEM | 1981 | 2.4747 | T-2508 |
| | | | | | | 1981 | 2.5231 | T-2550 |
| Muskego,Keith Twp. | 42B/1NE | Noranda Expl.Co.L | | Assess. | Mag,HEM | 1981 | 2.4748 | T-2547 |
| Neill Twp. | 41O/5SE | E.J.Burns Property | Au | Assess. | str,Manual | 1982 | ------ | T-2463 |
| Neville,St.Louis Twps. | 41P/12SW | Canadian Gold Resources L | Au | Assess. | str,GL | 1982 | ------ | T-2488 |
| Ogden Twp. | 42A/6NW | J.V.Bonhomme Prop | Au | Assess. | Mag,EM | 1981 | 2.4559 | T-1968 |
| Ogden Twp. ,Stock Twp | 42A/6 | Canamax Resources Inc. | Au | Assess. | DD-2-228 m | 1982 | ------ | T-1978 |
| Ogden Twp. | 42A/6SW | Comstate Resources L | Au | Assess. | GC | 1982<br>1981 | 2.4995 | T-2560 |
| Ogden Twp. | 42A/6NW | Kidd Creek Mines L | Au | Assess. | SD-9-321 m | 1983 | ________ | T-2327 |
| | | | | Assess. | DD-13-275 m | 1982 | 2.5096 | T-2327 |
| Ogden Twp. | | Surveymin L | Au | Assess. | GL,str | 1982 | 2.4926 | T-2321 |
| Osway Twp. | 41O/9W | Hargor Resources Inc. | Au | Assess. | DD-5-350 ft. | 1982 | ------- | T-2517 |
| Osway Twp. | 41O/9SW | Maverick Mountain Resources | Au | Assess. | DD-1-70 m | 1982 | ------- | T-2524 |
| Osway,Huffman Twps | 41O/9Ne | Osway Explorations L | Au | Assess. | str | 1982 | ------ | T-2452 |
| | | | | | DD-11-5413 ft. | 1982 | ------ | T-2452 |
| | | | | | EM,Mag | 1982 | 2.4710 | T-2452 |
| Otagwahigan River Area | 42P/1 | Selco Inc. | diamonds | Assess. | Mag | 1981 | 2.4622 | T-2489 |
| Ottaway Twp. | 42A/14NW | Surveymin L | Au | Assess. | Assays | 1982 | 2.4840 | T-2323 |

TABLE 3 Continued

| Location | NTS | File Name | Commodities Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Price,Fripp Twps | 42A/6SW | Argentex Resource |  | Assess. | Mag,Vlf | 1981 | 2.4709 | T-2631 |
|  |  | Expl.Co L |  |  |  |  |  |  |
| Prosser Twp. | 42A/14SE | Kidd Creek Mines L |  | Assess. | Mag,HEM | 1982 | 2.4870 | T-1761 |
| Prosser,Wark Twps | 42A/11NE | P.Rumbla property |  | Assess. | Vlf | 1982 | 2.4734 | T-2434 |
| Prosser,Tully Twps. | 42A/14SE | Abitibi Price Inc |  | Assess. | Mag,HEM | 1981 | 2.4779 | T-2344 |
|  |  |  |  |  |  |  | 2.4322 |  |
| Raney Twp. | 41O/13NW | J-Den Expl L | Au | Assess. | Vlf,Mag | 1981 | 2.4580 | T-2180 |
| Raney,Crockett | 41O/'3SW | Lacana Mining Corp | Au | Assess. | GL | 1983 | 2.5536 | T-2373 |
| Reaume Twp. | 42A/14NE | Surveymin Ltd. | Au | assess. | assays | 1982 | 2.4983 | T-2361 |
| Reid Twps. | 42A/11 | Gulf Minerals |  | Assess. | Mag | 1980 | 2.615 | T-1929 |
|  |  | Canada L |  |  |  |  |  |  |
| Reid Twp. | 42A/11NW | Kidd Creek Mines L |  | Assess. | AEM,Amag | 1981 | 2.4652 | T-1869 |
|  |  |  |  |  | DD-3-929 m | 1983 | ------ | T-1869 |
| Ridge L.Area | 42J | Selco Inc. | diamond | Assess. | DD-3-338 m | 1982 | ------ | T-2407 |
| Ridge L.North, |  |  |  |  | DD-1-65 m | 1982 | ------- | T-2368 |
| Ridge L.South, |  |  |  |  | Mag | 1982 | 2.4796 | T-2407 |
| Ridge L.West, |  |  |  |  |  |  | 2.4603 |  |
| Dent L., |  |  |  |  |  |  |  |  |
| Morrison L.areas |  |  |  |  |  |  |  |  |
| Ridge Lake,Area S. | 42J | Shell Canada |  | Assess. | OVD-4-475 m | 1981 | 2.4886 | T-2405 |
|  |  | Resources L |  |  |  |  |  |  |
| Robb Twp. | 42A/12SE | C.Morgan Property |  | Assess. | man,str | 1983 | ------ | T-2370 |
| Robb Twp. | 42A/12SE | Vetco Expl.Co.l |  | Assess. | Mag,Vlf | 1981 | 2.4150 | T-2529 |
| Rogers Creek Area, | 42F/16NE | Mattagami Lake Expl |  | Assess. | Mag.Hem | 1981 | 2.4680 | T-2507 |
| Limestone Rapids |  | Co. L |  |  |  | 1982 | 2.4804 |  |
| Area |  |  |  |  |  | 1982 | 2.4803 |  |
|  |  |  |  |  |  | 1981 | 2.4679 | T-25??? |
| Rollo Twp. | 41O/15SE | Lacana Mining Corp. | Au | Assess. | Mag,EM | 1983 | 2.555? | T-2594 |
|  |  |  |  |  | DD-1-135 m |  |  |  |
| Sewell Twp. | 42/A7NE | Goldfields Mining | Au | Assess. | Mag,Vlf | 1982 | 2.4891 | T-2535 |
|  |  | Corp. |  |  |  |  |  |  |
|  | 42A/6NW | L.Lapierre Property | Au | Assess. | str | 1983 | ------ | T-2597 |
| Sewell twp. | 42A/6NW | R.Tremblay Property | Au | Assess. | Manual | 1983 | ------ | T-1925 |
| Shaw Twp. | 42A/6E | Canico |  | Assess. | AMag,AEM,ARa | 1981 | 2.4881 | T-2540 |
| ,Eldorado Twp. |  |  |  |  |  |  |  |  |
| Shaw Twp. | 42A/6NE | Pamour Porcupine | Au | Assess. | Mag,Vlf | 1982 | 2.4634 | T-2474 |
|  |  | Mines L |  |  |  |  | 2.5420 |  |
| Shaw Twp. | 42A/6NE | Hollinger Argus L | Au | Assess. | GL | 1982 | 2.5202 | T-2315 |
|  |  | Brown McDade Option |  |  |  |  |  |  |
| Sheraton,Thomas | 42A/7NE | Johns-Manville | Au | Assess. | VEM,Mag | 1981 | 2.4598 | T-2542 |
| Twps. |  | Canada Inc. |  |  |  |  |  |  |
| Sheraton,Timmins |  |  | Au | Assess. | str | 1982 | ------ | T-1836 |
|  |  |  |  |  | Vlf,Mag | 1981 | 2.4500 | T-1836 |
| Shetland Twp., | 42G/6NW | M.Villeneuve |  | Assess. | Mech.,Manual | 1982 | ----- | T-1500 |
| Stauton Twp. |  | Property |  |  |  |  |  |  |
| Sigal Lake Area | 32E/12S | Hudbay Mining L |  | Assess. | DD-1-87 m | 1982 | ----- | T-2390 |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Black Twp. | 42G/16W | R.Arsenault Property | | Assess. | Manual,mech | 1982 | ----- | T-1935 |
| | | | | | | 1983 | ------ | T-2363 |
| Stetham Twp. | 41P/3SE | Beach Gold Mines L | | Assess. | Mag,Vlf | 1982 | 2.4855 | T-1755 |
| Stock Twp. | 42A/10SE | Cominco L | Au | Assess. | OVD-11-465 m | 1983 | ------ | T-2523 |
| | | | | | DD-4-165 m | 1983 | ------- | T-2523 |
| Sunday Lake Area | 32L | Dome Exploration | Au | Assess. | DD-15-2260 m | 1983 | ------ | T-2369 |
| .W.Sunday L. | | Canada L | | | Mag | 1982 | 2.5036 | T-2451 |
| Sunday L W | 32L/4 | Global Energy Resources L | Au | Assess. | DD-7-1000 m | 1983 | 2.3904 | T-2362 |
| Sunday L W | 32L/14 | Newmont Expl. Co.L | Au | Assess. | GL,Thin sections | 1981 | 2.5194 | T-2457 |
| Sunday L Area | 32L/4 | Noranda Expl Co. L | Au | assess. | Mag,Hem | 1981 | 2.4731 | T-1695 |
| | | | | Assess. | Mag,HEM | 1982 | 2.4728 | T-2518 |
| | | | | Assess. | %Ag,Hem | 1982 | 2.4729 | T-1699 |
| | | | | Assess. | Mag,HEM | 1982 | 2.4729 | T-1699 |
| Sunday L W | 32L | Omab Enterprises | Au | Assess. | DD-8-1415 m | 1983 | ------ | T-1924 |
| Sunday L.., | 32E/13NE | Pelangio Larder | Au | Assess. | VLF | 1980 | 2.4162 | T-2500 |
| Lower Detour L. | | Mines L | | | | 1981 | | |
| W.Sunday lake | 42L/4SW | Northern Energy Corp | Au | Assess. | Mag | 1981 | ------ | T-2485 |
| Swayze Twp. | 41O/15SE | Troud'our Resources | Au | Assess. | Vlf,Mag | 1982 | 2.5002 | T-2542 |
| Thomas Twp | 42A/7NW | D.R.Pyke Property | Au | Assess. | GC | 1981 | 2.4216 | T-2515 |
| Thomas TWp. | 42A/7Nw | W.P.M. Resources L | Au | Assess. | GC | 1981 | 2.4348 | T-1994 |
| Thorneloe twp. | 42A/6SW | D.R.Pyke Property | Au | Assess. | DD-1-134 m | 1983 | ----- | T-2428 |
| Tisdale Twp. | 42A/11SE | R.E.Allerston Property<br>Kennco Explorations Canada L | Au | Assess. | GC,Mag.VLF | 1981 | 2.4116 | T-2393 |
| Tisdale Twp | 42A/11SE | Hollinger Argus L. | Au | Assess. | Vlf | 1981 | 2.4544 | T-2501 |
| Tisdale Twp | 42A/11SW | Hollinger Argus L. | Au | Assess. | Vlf | 1981 | 2.4545 | T-2502 |
| | | | | | | 1981 | 2.4543 | T-2520 |
| | | | | | | 1981 | 2.4546 | |
| | | | | | | 1981 | 2.4547 | |
| | | | | | | 1981 | 2.4548 | |
| | | | | | Mag | 1981 | 2.3329 | T-2501 |
| | | | | | Mag,Vlf | 1983 | 2.5449 | T-2520 |
| | 42A/6NW | H.Keller Property | Au | Assess. | DD-1-61 m | 1983 | ------ | 1-2585 |
| Tisdale,Whitney Twps. | 42A/11SE | D.Meunier Property | Au | assess. | mech equip | 1982 | ------ | T-2486 |
| Tisdale Twp. | 42A/11SE | Pamour Porcupine Mines L | Au | Assess. | Mag | 1982 | 2.4732 | T-2439 |
| | 42A/11SW | Pamour Porcupine Mines L | Au | Assess. | VLF | 1981 | 2.4711 | T-2439 |
| | | | | | | 1982 | 2.4091 | T-1657 |
| | | | | | GL | 1982 | 2.4955 | T-1954 |
| Tisdale Twp. | 42A/11SE | Placer Development | Au | Assess. | GL,Mag,Vlf | 1982 | 2.5053 | T-1855 |
| | | D.R.Pyke Property | Au | Assess. | Mag,Vlf | 1982 | 2.5112 | T-2417 |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Tisdale Twp. | 42A/6NW | Vedron Ltd. | Au | Not | prospectus | 1980 | 63.3910 | T-2475 |
| | | | | Assess. | | | | |
| | | 508825 Ontario L | Au | Assess. | mech,str,man | 1983 | ------ | T-2556 |
| Tooms Twp. | 41O/10NW | Highland Crow | Au | Assess. | DD-3-455 m | 1982 | ------- | T-2493 |
| | | Resources | L | | | | | |
| | | Kidd Creek Mines L | Au | Assess. | Mag,Hem | 1983 | 2.5569 | T-2589 |
| Traill Twp. | 42I/4 | Selco Inc | diamonds | Assess. | Mag | 1982 | 2.5121 | T-2551 |
| Tully Twp. | 42A/14SE | Kidd Creek Mines L | | Assess. | OVD-3-630 m | 1982 | 2.5236 | T-2531 |
| | 42A/11NE | | | Assess. | OVD-4-515 m | 1981 | 2.5237 | T-2448 |
| | 42A/11NE | Kidd Creek Mines L | | Assess. | OVD-5-220 m | 1981 | 2.4880 | T-2448 |
| Tully Twp. | 42A/14SE | Newmont Expl Co. L | | Assess. | Core Samples | 1981 | ------- | T-2451 |
| ,Duff Twp. | | | | | | 1982 | | |
| | | | | Assess. | Assays | 1982 | 2.4906 | T-2451 |
| | | | | Assess. | Mag,HEM | 1982 | 2.5193 | T-2451 |
| Tully Twp. | 42A/11NE | Whitestar Copper | BM | Assess. | DD , HEM | 1981 | 2.4456 | T-2386 |
| | | Mines L | | | Core samples | | | |
| Turnbull Twp. | 42A/5NE | Golden Grail | | Assess. | VLF | 1982 | 2.4717 | T-2509 |
| | | Minerals | | | | | | |
| | | Exploration Inc | | | | | | |
| | | J.Larche Option | | Assess. | Mech.str | 1981 | ------ | T-1996 |
| Valentine Twp. | 41I/5SE | Selco Inc. | diamonds | Assess. | Mag | 1983 | 2.5441 | T-2565 |
| Wark,Prosser Twps | 42A/11N | Placer Development L | | Assess. | Dd-9-1528 m | 1982 | ----- | T-2426 |
| | | | | | Mag,HEM | 1982 | 2.5017 | T-2426 |
| Wark Twp. | 42A/11SW | D.R.Pyke Property | | Assess. | AEM | 1981 | 2.56 | |
| Whitney Twp. | 42A/11/6 | Kidd Creek Mines L | Au | Assess. | Mag,HEM | 1981 | 2.4726 | T-2312 |
| | | | | | OVD-11-143 m | 1982 | 2.5083 | T-2312 |
| DD-1-277 m | 1983 | ------ | T-2312 | | | | | |
| | | | | | Mag,HEM | 1983 | 2.5598 | T-2312 |
| Whitney Twp. | 42A/11SW | Lost Tag Investment | Au | Assess. | EM,Mag | 1981 | 2.4626 | T-2536 |
| | | Syndicate | | | | | | |
| Whitney Twp. | 42A/11SE | R.Middleton | Au | Assess. | GL,Mag,Vlf | 1983 | 2.5561 | T-2592 |
| Whitney Twp. | 42A/11SE | Placer Development L | Au | Assess. | OVD-24-273 m | 1981 | 2.4745 | T-2491 |
| | | | | | Mag,Vlf | 1981 | 2.4900 | T-2491 |
| | | | | | GL,Mag,Vlf | 1982 | 2.5505 | T-2491 |
| | | Rio Alto Expl L | Au | Assess. | Mag,Vlf | 1981 | 2.4041 | T-2453 |
| | | Shiningtree | Au | Assess. | DD-2-300 m | 1982 | | T-2532 |
| | | Gold Resources | | | | | | |
| Whitesides Twps | 42A/5NW | Smith-Morrison | | Assess. | GL,Mag,Vlf | 1981 | 2.4494 | T-1913 |
| | | Property | | | | | | |
| Woolrich Twp | 42C/2 | B.S.Haavaldsrud | | Assess. | DD-1-35 m | 1983 | ------ | T-2598 |
| Yeo Twp. | 41O/9NW | Kidd Creek Mines L | Au | Assess. | Mag,HEM,Vlf | 1982 | 2.5581 | T-2586 |

magnetometer surveys, VLF electromagnetic surveys and induced polarization surveys, in selected areas, were done. Nine diamond-drill holes totalling 1472 m were completed. Exploration on the property is to continue in 1984. Gold mineralization is within an altered zone containing pyrite and arsenopyrite within a coarse-grained mafic sill or flow. The strike of the structure conforms to the regional strike (110°) and the dip is almost vertical. Canico also did reconnaissance exploratory work on their 560 claims in Swayze, Denyes, and Rollo Townships in 1983. The company also completed 6 short diamond-drill holes on the Harrower Property adjacent to Pamour's Timmins Property (formerly the Hollinger Mine) in Tisdale Township. Few narrow low grade gold intersections were obtained. The option was dropped (Canico, personal communication, 1983).

Getty Mines Limited began a diamond-drill program in the Detour Lake area in late 1983. The company also carried out reconnaissance geology work in the Abitibi "Greenstone Belt" in the Timmins area (Getty Mines Limited, personal communication, 1983).

Lacana Mining Corporation was actively exploring in the Swayze "greenstone" area in 1983. Geological mapping and geophysical surveys were done on their properties in Garnet, Rollo, Cunningham, and Blamey Townships. Trenching was done over geophysical anomalies with shallow overburden. Two diamond-drill holes were drilled in Garnet Township and 1 in Rollo Township. Graphitic argillaceous sediments were intersected with no economic mineralization. Lacana Mining Corporation also drilled 3 holes in Tully Township directly east of the Nickel Offsets Limited's gold deposit in a joint venture with Canamax Resources Incorporated. No gold values were intersected (Lacana Mining Corporation, personal communication, 1983).

Hollinger Argus Limited completed 2 diamond-drill holes on their property adjacent to the Davidson Tisdale Property in Tisdale Township. Nothing of significance was intersected. The company also carried out reconnaissance geological work in Neill Township (Hollinger Argus Limited, personal communication, 1983).

Pamour Explorations carried out 3 diamond-drill programs on the Choi Property west of and adjacent to the Pamour No. 3 (Delnite) Property in 1983. The company also carried out geophysical surveys in Macklem and Cody Townships. An exploration program was started by Pamour Explorations on the old Desantis Gold Mine owned by J.V. Bonhomme Mining and Exploration Company Limited. An agreement in principal exists between the 2 parties (Pamour Explorations, personal communications, 1983).

Placer Development Limited drilled 2 deep and 2 shallow drillholes (total 2300 m) on ground in Deloro Township optioned from Comstate Resources. The property is adjacent to and west of the Choi Property presently being explored by Pamour Explorations. The purpose of the program was to test gold intersections obtained by Jasper Porcupine Mines Limited in 3 holes drilled in the 1930s. Good "gold geology" was intersected including carbonatization, silicification, and veining up to a few metres in width, with minor pyrite and arsenopyrite. Anomalous gold values of geochemical interest were obtained (Placer Development Limited, personal communication, 1983).

Bruneau Mining Corporation is conducting an exploration program on the optioned gold property of Clavos Porcupine Mines Limited in German and Stock Townships. Canamax Resources Incorporated is managing the project. Six holes have been drilled thus far, and drilling is taking place at the time of this writing (December 1983) (Canamax Resources Incorporated, personal communication, 1983; Northern Miner, October 6, 1983). Augdome Corporation Limited has been drilling from the 29th level of the Dome Mine to explore the northwestern sector of Augdome Corporation Limited's property in Tisdale Township (Augdome Corporation Limited, personal communication, 1983; Northern Miner, November 29, September 8, June 23, 1983).

Cleyo Resources completed a 9-hole (1700-foot) diamond-drill program on its claims in Carscallen Township. Four targets were drilled. At the time of this writing (December 1983), all of the assay results are not yet available (Cleyo Resources, personal communication, 1983; Northern Miner, September 29, 1983).

Pominix Limited has just begun (December 1983) a drill program in Macklem Township adjacent to the Aquarius Gold Property being brought into production by Asarco Incorporated. A geophysical program was completed on the property in 1983 (Pominex Limited, personal communication, 1983; Northern Miner, December 1, 1983).

Asarco Exploration Limited drilled 5 exploratory diamond-drill holes in Macklem Township to test 4 basal till anomalies derived from a previous overburden drill program. All holes intersected gold values in the bedrock (Asarco Exploration Limited, personal communication, 1983).

Quinterra Resources Incorporated reported in April 1983 that they had intersected gold values in 2 holes, 1600 feet apart, on their Sylvanite Creek Property in Tooms Township. Gold values were found to occur in a chemical sediment associated with an intensely altered carbonate zone. In the summer and fall of 1983, a program of stripping, geophysics, and another drill program was undertaken by the company. Fourteen holes were drilled, with 12 of the holes encountering anomalous gold values and alteration. Presently (December 1983), the company is conducting a geophysical program to define new targets in a zone of scattered gold mineralization and alteration which has thus far been identified for a strike length of 10 000 feet and for a width of 2000 feet. The company is presently seeking a joint venture partner to continue the program (W.O. Karvinen, consultant, personal communication, 1983; Northern Miner, April 14, July 21, August 11, September 8, October 27, 1983; George Cross Newsletter, July 13, August 9, December 8, 1983).

Collingwood Energy Incorporated carried out an exploration program in Greenlaw Township in 1983 which included geophysical surveys and prospecting. A geological horizon has been identified which may have the potential of hosting gold mineralization. Further work is planned for 1984 (George Cross Newsletter, October 12, 1983).

Carlson Mines Limited stripped a previously known gold showing on the southern shore of Ridley Lake in Rollo Township. The showing can be described as 3 parallel gold-bearing shear zones with scattered pyrite and quartz stringers totalling 150 feet in width. Wall rock is described as carbonatized mafic volcanic rocks. Grab samples have been taken and an induced polarization geophysical program has been done over the property (Carlson Mines Limited, personal communication, 1983; Northern Miner, September 29, 1983).

Samim Canada Limited drilled a total of 8 holes in 1983 on property optioned from Lenora Explorations Limited and Argentex Limited in Price and Fripp Townships. Drilling centred around an iron formation and narrow intersections of copper, lead, zinc, and silver were obtained (Samim Canada Limited, Lenora Explorations Limited, personal communication, 1983).

Nahanni Mines Limited resumed drilling on their property in Clergue Township this fall (Nahanni Mines Limited, personal communication, 1983; Northern Miner, June 2, September 8, October 27, 1983).

Gowest Amalgamated Resources Limited conducted a base-metal/silver exploration program in Adanac, Agate, Homuth, and Hardiman Townships. Geophysical surveys were run over numerous grids. Two diamond-drill holes were completed in Adanac Township. No economic mineralization was intersected (Assessment Files, Gowest Amalgamated Resources Limited, personal communication, 1983).

Tanglewood Consolidated Resources Incorporated has reported to be conducting an exploration program in Lizar Township on, and surrounding, the old Hiawatha Gold Property (Northern Miner, June 2, September 1, October 6, 1983).

Kerr Addison Mines Limited conducted a gold exploration program on the Karpovitch claims in Hoyle Township in early 1983, including diamond drilling (Assessment Files, Kerr Addison Mines Limited, personal communication, 1983).

A number of Vancouver-based junior resource companies are reported to be exploring in the Detour Lake area. Among those which reported drilling on their properties are Omab Enterprises Limited and a joint venture program between Global Energy and Trojan Energy. The other companies exploring include: Northern Energy Corporation, Corrie Copper Limited, Kenar Resources Limited, Colby Resources Corporation, Pacific Cyprus Minerals Limited, and East West Resources Limited (personal communications, 1983; Assessment Files, various articles in the George Cross Newsletter, and the Northern Miner, 1983.

Aside from those previously mentioned, junior resource companies with exploration programs in the Swayze area included: Dore Exploration Incorporated (Currie, Raney, and Swayze Townships); Dejour Mines Limited (Cunningham Township); Hanson Mineral Exploration Limited (Chester Township); Hargor Resources Incorporated (Champagne and Osway Townships); Jarvis Resources Limited (Groves, St. Louis, and Chester Townships); Kenty Resources (Swayze Township); Newstart Resources (Groves and St. Louis Townships) (personal communications, 1983; Assessment Files; various articles Northern Miner, George Cross Newsletter, 1983).

## Other Exploration and Development Activity

The 1983 diamond exploration program completed by Selco Incorporated consisted of the drilling of 2 NQ holes approximately 25 km west of Coral Rapids. Results of this drilling were reported to be negative (Selco Incorporated, personal communication, 1983).

The Ontario Energy Corporation drilled 29 holes during the 1983 winter program on their Exploratory Licence of Occupation. Results of this program were encouraging. During the past 3 years, the Ontario Energy Corporation has defined areas of significant lignite and oil shale potential. Lignite has been intersected at depth in 15 of the 59 holes drilled. Further work on the property is anticipated (Ontario Energy Corporation, personal communication, 1983).

Camchib Resources Incorporated, in partnership with New Venture Equities Limited, purchased the Martison phosphate-niobium property, 70 km north of Hearst, from Shell Canada Resources Limited. A winter drilling program using a sonic drill was carried out by Camchib Resources Incorporated in 1983. The drilling was a fill-in program to confirm the drill-indicated reserves outlined previously by Shell Canada Resources Limited. Camchib Resources Incorporated reported outlining indicated reserves of 57 million tonnes grading 23% phosphate pentoxide, 0.4% niobium pentoxide, and 0.4% rare earth oxides. The mineralization is in an unconsolidated residium overlying a carbonatite. Earlier work by Shell Canada Resources Limited indicated a potential for more than 100 million tonnes of material. Camchib Resources Incorporated will be carrying out another drill program in the winter of 1984 to further delineate the mineralization (Camchib Resources Incorporated, personal communication, 1983; George Cross Newsletter, August 12, 1983).

Sherritt Gordon Mines Limited completed 5 km of a corridor south from Highway 11 towards their phosphate property in Cargill Township. The corridor is to accomodate a power line, gas line, railroads, and a roadway. Work will be continuing in 1984 on the corridor and land clearing will be done on a tailings area. Financial assistance has been provided through a federal employment grant. A sample of vermiculite associated with the carbonatite intrusion has been sent for testing (Sherritt Gordon Mines Limited, personal communication, 1983).

# Ontario Geological Survey Activities

Although there were no Precambrian Geology Section programs undertaken in the Timmins Resident Geologist's area this year, several of the other sections of the Ontario Geological Survey initiated projects in the area (*see* Figure 4).

## Engineering and Terrain Geology Section

As part of the Hydrocarbon Energy Program, the Peatland Inventory Project was developed under the supervision of J.L. Riley, Engineering and Terrain Geology Section. A study area of 16 600 km$^2$ in Hearst District was one of the 4 areas selected for examination. Open File Report 5450, Peat and Peatland Evaluation of the Hearst Area, details both procedures and results of the program.

In addition, the Ontario Centre for Remote Sensing was involved in an evaluation of peat deposits in 1700 km$^2$ area northwest of Timmins. An attempt was made to provide volume estimates and peat type characterization through reconnaissance field study based on LANDSAT imagery interpretation.

## Lignite Assessment Project—Moose River Basin, James Bay Lowlands

As part of the Lignite Assessment component of the Hydrocarbon Energy Resources Program, a reconnaissance drilling program was completed in the Moose River Basin. The objective of the Lignite Assessment Project is to define the lignite potential of the James Bay Lowlands, and at the same time to stimulate private sector interest in exploration of the region. Seven holes, 10 to 26 km apart, were drilled and borehole geophysical surveys were completed. Results of this program are to be released as an Open File Report.

During September-October 1983, the Ontario Geological Survey completed a deep stratigraphic borehole on the northeastern shore of Scheivert Lake in the James Bay Lowlands. The hole was cored (mainly NQ size) from surface to the Precambrian basement and reached a total depth of 2036 feet; the top of the Precambrian was at 1928 feet. The drilling was carried out by Longyear Canada Limited and the hole was geophysically logged by BPB Instruments Limited. This operation formed part of the Lignite Assessment Project, a component of the BILD funded Hydrocarbon Energy Resources Program.

## Mineral Deposits Section

Applications of Age-Dating to Gold Mineralization: S. Marmont, Geologist, Mineral Deposits Section, is presently working on a program of age-dating of various rock units in attempt to provide a definite time frame for geological events in the evolution of the Archean crust.

Ultimately, such data will provide more information on gold mineralization, and further development of this technique may allow for its use as a gold exploration tool. In the Timmins Resident Geologist's area, samples were collected from the Pearl Lake Porphyry, the Preston Porphyry, and the Krist fragmental; and samples of felsic rocks were collected from sites in Bartlett, Douglas, and Kidd Townships.

Two M.Sc. programs were initiated in the Timmins area with support from the Mineral Deposits Section.

P.C. Wood, under the supervision of E.T.C. Spooner of the University of Toronto, is investigating the significance of scheelite in the Hollinger-McIntyre orebody by documenting its distribution and carrying out extensive petrological and analytical studies. D.W. Piroshco, working with C.J. Hodgson at Queen's University, mapped the surface geology of the Coniaurum Mine at 1:2400 scale and will complete a structural analysis of this geology to interpret its deformation history and the relatonship of this history to gold mineralization.

## Geophysics-Geochemistry Section

### Night Hawk Geophysical Test Range

During the 1983 field season, testing of newly developed exploration technology continued on the Night Hawk Test Range in Thomas Township. The existing survey grid has been extended and one line was cut to a width of 3.0 m for visual location during airborne surveys. Ground electromagnetic surveys, including MAXMIN II pulse EM, GENIE, EM-37, and ELFAST have been completed over parts of the grid. Gravity, magnetic gradiometer, and elevation data have been collected for the entire grid. In addition to work completed by the Ontario Geological Survey, the following organizations have made use of the test range

Geological Survey of Canada
University of Toronto
Questor Surveys Limited
Aerodat Limited
Dighem Limited
Geosurvey International Limited
Geonics Limited

A second test range is currently being established by the Ontario Geological Survey in northwestern Sheraton Township.

## Ontario Geoscience Research Grants Program

The Ontario Geoscience Research Grant Program was initiated in 1978 as a means of supporting mission-oriented research at Ontario Universities, to complement research studies at the Ontario Geological Survey. A total of 22 projects were approved for funding in 1982-1983. Of these projects, 11 were renewal grants (*see* MP 113, Appendix).

A 1982-1983 grant recipient (principle applicant) with a project directly related to the Timmins Resident Geologist's area is:

W.S. Fyfe, University of Western Ontario:

Grant 134, Stratigraphy and Geochemistry of Northern Ontario Carbonaceous Deposits: Onakawana Lignites and James Bay Peats.

Recipients with studies referring to the Timmins Resident Geologist's area are:

D.W. Strangway, University of Toronto:

Grant 118, Surface Electromagnetic Mapping in Selected Positions of Northern Ontario.

F.J. Wicks, University of Toronto:

Grant 138, Mineralogy and Geochemistry of the Chrysolite Asbestos Deposits of Ontario.

## Ontario Mineral Exploration Program (OMEP)

This program came into effect in 1980 to provide incentives to entrepreneurial individuals and companies not producing minerals in Ontario to invest in mineral exploration in the province. These incentives are in the form of grants and tax credits to cover part of the risk capital. In the Porcupine Mining Division, there were 32 programs designated for OMEP assistance from January 1 to December 15, 1983. Total budgeting expenditures are $14 859 000 of which $10 642 000 are expenditures eligible for the program. OMEP grant/tax credit assistance will amount to $2 660 000.

# Report of Activities 1983
# Kirkland Lake Resident Geologist Area, Northern Region

**Howard Lovell[1], Gary Grabowski[2], and David Guindon[3]**

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## Introduction

The number of man-days of assessment work credit assigned in the Larder Lake Mining Division in 1983 totalled 304 770, 1983 and 1982 being the 2 most active years to date. The high level of activity should be sustained into 1984, because active claims in 1983 totalled 17 946, and claims recorded totalled 8354; the corresponding statistics for 1982 being 13 458 and 3253. For 6 years, the Bear Island Indian caution has prevented the recording of mining claims and consequently most exploration in about one-quarter of the Larder Lake Mining Division.

## Resident Geologist Staff Activities

Permanent staff include Howard Lovell, Resident Geologist; Gary Grabowski, Resource Geologist; and Faye M. St. Jean, Secretary. Additional periods of assistance were provided by David Guindon, Core Library Geologist; by Todd Beckett, Daniel Reeves, and Glenn Whyte, Geological Assistants; by Stanley Gorzalczynski and Michael Aldred, Draftsmen; by Bonnie Borden and Sylvia Chouinard, Clerk Typists; by Chantal Francoeur, Experience '83 student; and by Luce Brousseau, Ontario Career Action Program student.

Activities of the Resident Geologist Office included:

1. responding to a record 2600 inquiries from exploration, mining and government personnel, and the general public

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[1] Resident Geologist, [2] Resource Geologist, [3] Core Library Geologist, Ontario Ministry of Natural Resources, Kirkland Lake.

2. preparing 55 reports on mineral property examinations, diamond-drill core (logs), field trips, and technical papers
3. guiding geological field trips to Kirkland Lake-Larder Lake area gold occurrences for 14 groups of mineral explorationists, government, university, and foreign geologists, and 3 Ontario Ministry of Natural Resources Junior Ranger camps
4. collecting about 11 000 m (36 000 feet) of diamond-drill core for the drill core library, construction of which was completed in December 1983
5. responding to Road Proposals and Forest Management Agreements, Mining Hazard Lands reviews, etc
6. filing for ready retrieval the assessment work representing 304 770 man days.

## Drill Core Storage Library

The Drill Core Storage Library for the Larder Lake Mining Division has just been completed. The drill core, thus far collected and stored, will be moved into the library in 1984. It is expected that the Core Library will be fully operational with all core indexed by early spring, 1984.

In 1983, approximately 11 000 m of drill core were collected, bringing the total to about 67 000 m. The task of indexing the core has been started. Figure 4 shows the location of most of the drillholes for which core is stored.

Data pertaining to the drill core is stored on a microcomputer using the program dBASE-II. This information includes the company name, company drillhole number, year of completion, township, drillhole length, amount of core stored and whether assays, chemical analyses, thin sections or polished sections are available. A number of search programs have been written to manipulate the data, thus making it possible to list all drillholes from a specific area, by a certain company name or other criteria.

Logs and other information related to the drill core will be stored at the core library. It is not intended that a complete set of assessment data be stored at the core library, but rather only that related to the drill core. An index, by company, of core or samples of core stored at the library is available at the Resident Geologist's Office. Eventually, the logs in the Resident Geologist's Office will be marked if core or samples are stored. This will allow users of the assessment files to quickly identify drillholes from which core has been stored.

The Drill Core Library is located west of Kirkland Lake, on Highway 66 at the Ministry of Natural Resources District Office compound. It can be reached by telephoning (705)642-3222 or by writing to Drill Core Library, Ontario Ministry of Natural Resources, Box 129, Swastika, Ontario, P0K 1T0.

## Mining Activity

Total gold production in the Larder Lake Mining Division at the end of 1982 is shown in Table 3.

Nine mines operated during 1983, 5 of them producing gold and by-product silver; 2 producing silver and by-product cobalt; 1 producing iron pellets; and 1 producing barite.

The proposed deepest single-lift vertical shaft in the Americas, at the Macassa gold-silver mine of Lac Minerals Limited, proceeded on schedule towards the planned completion in 1985 at a depth of more than 7200 feet.

Camflo Mines Limited diamond drilled several thousand metres in Holloway Township.

Canamax Resources Incorporated did considerable diamond drilling in Holloway Township and elsewhere east of Matheson.

Golden Harker Explorations Limited's access road was constructed to the shaft in Harker Township by Phelps Dodge Corporation of Canada Limited.

The new McBean gold-silver mine and the former Upper Canada mill (capacity 500 tons per day) owned by Inco Limited and Queenston Gold Mines Limited were developed toward the production stage, which is scheduled for early in 1984.

Lac Minerals Limited completed 3 years of exploration work on the Martin-Bird gold prospect in Hearst Township.

The Larder Resources Incorporated property underwent extensive deep diamond drilling by Eldor Resources.

Lenora Exploration Limited diamond drilled more than 5000 m at its Omega past gold producer, and stripped overburden in preparation for planned mining out of the surface pillars to begin in 1984.

Marshall Minerals Corporation bulk sampled several hundred tonnes from its Boston Township gold property.

Maude Lake Gold Mines Limited stripped overburden at its Argyll property in Beatty Township, in preparation for open pitting a bulk sample for treatment for gold at Noranda.

North Kirkland Mines Limited diamond drilled several thousand feet of surface holes, dewatered the Glenora shaft, and sampled the 150-, 300-, and 450-foot levels.

Silver Lake Resources Incorporated drove a decline ramp 1012 feet long (to 210 feet vertically below surface) at its silver property in Mickle Township west of Elk Lake.

Sudbury Contact Mines Limited open pitted a 2000-tonne bulk sample from its Knutson Zone property.

**TABLE 1** | **SUMMARY OF CLAIMS RECORDED AND ASSESSMENT WORK CREDIT**

| Year | Claims Recorded | Claims Cancelled | Claims Active | Diamond Drilling (Man Days) | Geophysical Surveys (Man Days) | Geological Surveys (Man Days) | Total (Man Days) |
|---|---|---|---|---|---|---|---|
| 1983* | 7,971 | 3,334 | 10,095 | 102,914 | 93,992 | 14,493 | 279,673 |
| 1982 | 3,253 | 5,218 | 13,450 | 99,526 | 139,311 | 17,926 | 313,690 |
| 1981 | 5,490 | 2,697 | 15,423 | 69,906 | 125,459 | 19,536 | 247,007 |
| 1980 | 6,299 | 1,034 | 12,622 | [illegible]4,454 | 115,031 | 10,901 | 209,357 |
| 1979 | 4,261 | 1,452 | 8,157 | 29,714 | 25,352 | 4,990 | 60,763 |
| 1978 | 1,710 | 2,065 | 5,240 | 32,602 | 30,100 | 8,807 | 87,144 |
| 1977 | 1,826 | 2,334 | 5,703 | 37,101 | 45,436 | 1,820 | 98,992 |
| 1976 | 2,350 | 2,979 | 6,712 | 47,724 | 42,330 | 6,220 | 102,936 |
| 1975 | 2,916 | 5,010 | 7,341 | 45,000 | 30,047 | 6,730 | 90,624 |
| 1974 | 4,757 | 2,296 | 3,435 | 40,670 | 55,716 | 4,441 | 110,165 |
| 1973 | 3,260 | 3,214 | 6,974 | 34,113 | 35,011 | 8,150 | 92,616 |
| 1972 | 3,253 | 4,740 | 6,781 | 39,371 | 52,351 | 3,350 | 106,026 |
| 1971 | 4,065 | 3,046 | 8,260 | 29,433 | 40,705 | 4,764 | 96,047 |
| 1970 | 4,315 | 3,704 | 8,049 | 25,603 | 20,603 | 4,133 | 73,157 |
| 1969 | 3,404 | 5,273 | 7,438 | 50,092 | 45,713 | 15,029 | 130,185 |
| 1968 | 4,171 | 7,909 | 9,307 | 74,649 | 82,637 | 5,799 | 180,437 |
| 1967 | 5,450 | 7,341 | 13,045 | 79,172 | 29,073 | 4,032 | 143,600 |
| 1966 | 7,606 | 11,101 | 14,936 | 117,544 | 30,971 | 8,050 | 182,352 |
| 1965 | 9,331 | 6,906 | 10,431 | 123,129 | 80,259 | 6,530 | 257,029 |
| 1964 | 12,042 | 3,004 | 22,912 | 77,807 | 32,644 | 11,725 | 149,198 |
| 1963 | 4,710 | 3,895 | 13,954 | 95,696 | 16,241 | 4,226 | 138,627 |
| 1962 | 4,675 | 4,020 | 13,139 | 63,003 | 5,494 | 5,099 | 97,219 |
| 1961 | 3,749 | 4,451 | 12,492 | 47,862 | 5,494 | 1,118 | 79,219 |
| 1960 | 5,024 | 6,747 | 13,194 | 75,123 | 7,296 | 4,751 | 104,632 |
| 1959 | 6,419 | 5,594 | 14,917 | 22,947 | 3,792 | 1,404 | 80,322 |
| 1958 | 8,582 | 7,108 | 14,902 | 37,301 | 7,481 | 1,941 | 66,703 |
| 1957 | 4,664 | 8,212 | 12,618 | 95,934 | 12,593 | 3,940 | 139,091 |
| 1956 | 9,673 | 3,594 | 16,166 | 77,879 | 20,982 | 6,693 | 130,894 |
| 1955 | 4,182 | 3,999 | 10,087 | 75,561 | 3,389 | 3,529 | 105,925 |

* to Nov. 30

Note: 1955 to 1967 includes Larder Lake, Montreal River and Timiskaming Mining Divisions

**TABLE 2** | **MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.**

**Ontario Geological Survey Reports**

GR 225

**Open File Reports**

OFR 5386
OFR 5394
OFR 5395
OFR 5439
OFR 5440
OFR 5442
OFR 5444
OFR 5447
OFR 5455
OFR 5466
OFR 5467
OFR 5468
OFR 5473
OFR 5477
OFR 5475
OFR 5476
OFR 5478
OFR 5479

**Preliminary Maps - Geological Series**

**Preliminary Maps - Data Series**

**Aggregate Resources Publications**

**Federal - Provincial Maps**

**Coloured Maps**

MAP 2465

**Northern Ontario Engineering Geology Terrain Studies Reports**

**Northern Ontario Engineering Terrain Studies Maps**

**Mineral Resources Branch Publications**

MPBP 16
MPBP 17
Video Census 2

**Miscellaneous Papers**

MP 77
MP 103
MP 105
MP 106
MP 107
MP 108
MP 110
MP 113
MP 114
MP 115
MP 116
STUDY 24

# Property Visits

## C. Bush "Heather Lake" Gold Occurrence (1)

### Bryce Township

Most outcrops in the Heather Lake area consist of pyroclastic breccia and tuff, and porphyritic lavas and dikes. Much of the breccia is made up of angular to rounded blocks (maximum 1.5 m long) that may represent fallback collapse into a caldera, or a debris flow. Some fragments contain flat chloritic flakes which appear to outline crushed gas bubbles; while others are clearly vesicular, possibly indicating that overlying loads never built up to a great thickness above these rocks.

The main rock types are calcalkalic mafic to intermediate volcanic rocks containing fragments (and phenocrysts) of white feldspar (average 3 mm long), and pale green or pale brown material, and fragments of bedded material. Typically, fragments are paler coloured than matrix, although some are darker, rustier, and differentially weathered. Quartz veins contain pyrite, a little chalcopyrite, and visible gold. Where observed, "flats" (horizontal veins) crosscut steeply dipping quartz veins.

Heather Lake was surveyed by MAXMIN, using 3 strengths to confirm the presence of a sulphide zone in the lake bed at a trend of 070° from the largest island. This zone is not known to have been diamond drilled.

## M. Dyment and J. Kidston Gold Occurrence (2)

### Lebel and Teck Townships

South of Kirkland Lake, roughly parallel to the Larder Lake Fault zone, prospectors have delineated a new "gold zone", 15 km long, by using ultraviolet illumination as an inexpensive means to trace scheelite and calcium tungstate molybdate, which are indicator minerals for gold. The luminiscent minerals are present in quartz-carbonate veins and are disseminated in metasediments. Fifty samples were analyzed for gold from along the scheelite zone, and 50 from a parallel area 300 m away. The scheelite (and gold) may emanate from, or form a halo of, a metamorphic aureole around the nearby Lebel and Otto Townships' syenitic stocks, or may have originated as placer concentrations of resistates, or as material adsorbed by decaying organic matter in the sedimentary host rocks.

## Esso Minerals Canada Gold Occurrence (3)

### Chesney Bay Area, Purvis and Galna Townships

During 1981 and 1982, a total of 56 overburden holes (8155 feet) were "sonic" drilled by Midwest Drilling Incorporated using a Sound Dynamics Resonant Drill powered by a Deutz 8-cylinder 200 horsepower engine (Kirkland Lake Resident Geologist Office files, submitted by Esso Minerals Canada).

The drive system engine (sonic tub manufactured by Hawker-Siddley Incorporated) produces a high-speed rotary motion that is converted to a high-speed slight vertical movement (maximum 8000 vibrations per minute) in drill rods. The drill rods are also propelled in a constant slow rotary movement. Core barrels are 3.5 inches in diameter and 10 or 15 feet long. Button bits containing carbide teeth are used.

This drilling provided relatively undisturbed overburden sections that were vibrated into plastic sleeves so as to resemble diamond drill cored bedrock. Boulders were vibrated aside or cored through. The sonic drill system cored ½ to 3 feet into bedrock (depending on hardness of rock type). The depth limitation of the system is more than 85 m (the deepest hole drilled during the program).

The program succeeded in determining the bedrock type vertically beneath the drill and the entire soil section in the drillhole; as well as sampling esker material suitable for tracing indicator minerals, some of which are from distant sources, and sampling basal till that contained indicator minerals derived from nearby sources.

## Lake Shore Mines Limited Gold Producer (4)

### Teck Township

From 1918 to 1968, Lake Shore Mines Limited produced almost 8½ million ounces of gold and 2 million ounces of silver from less than 17 million tons of milled ore. Shut down since 1967, Lake Shore Mines Limited drove a scoop tram decline ramp in 1983 and began producing gold and silver from the crown pillar

The best ore has developed where syenite porphyry, quartz-feldspar porphyry, syenite, augite syenite, and metasediments are interfingered. Vein material consists of quartz, carbonate, tourmaline (black), carbonaceous material ("graphite"), molybdenite, and gold. Wallrocks are "bleached" (i.e. contain sericite, etc.) in places and in some places are reddened by hematite. Faults are filled with chloritic gouge and rusty brownish orange carbonate, and characteristically are barren of gold.

The ultimate origin of this typical Kirkland Lake type of gold ore is considered by Jensen (1981; personal communication, 1983) to be Kerr Addison type gold ore that was upgraded when it (and associated host rocks) subsided and underwent metamorphism and partial melting so that the light differentiates formed the syenitic intrusive and extrusive rocks, and the gold-bearing quartz veins.

## Lenora Exploration Limited "Omega" Gold Past Producer (5)

### McVittie Township

In 1913, 1926-1928, and 1936-1947, ore milled totalled 1 615 081 tons, from which 214 098 ounces of gold and 29 290 ounces of silver were produced.

In 1983, work consisting of bulldozer stripping and backhoe trenching, supplemented by pressure hosing, plus 17 000 feet of diamond drilling, were carried out by Lenora Exploration Limited. According to consultant geologist Guy Hinse (personal communication, 1983), a typical section across strike of the ore zone consists of the following:

> *Massive carbonatized komatite flow*
>
> *Wisps of carbonatized komatiite, and sericite in komatiite*
>
> *Thin carbonate interbedded with chert that contains auriferous pyrite and metamorphically differentiated layers of sericite, probably formed from clay minerals. Where fractured or fragmented by dessication cracks, interstitial silica, pyrite, and gold were remobilized upward as evidenced by increased* $O_{16}$:$O_{18}$ *in the the siliceous material "healing" the cracks.*
>
> *Carbonate rock where influx of carbonaceous material was oxidized*
>
> *Cherty mudstone with auriferous pyrite (recrystallizes to "porphyry" under 3 km of load or 300°C, at which point porphyroblasts of feldspar form)*
>
> *Mudstone containing "graphite", and in places base-metal sulphides*
>
> *Greywacke with "graphite" slips where carbonaceous material was prevented from oxidation by rapid burial in detritus*
>
> *Variolitic basalt flow.*

Farther from the gold ore, i.e. closer to the source of epiclastic detritus, the channel-filling section (deposited during a marine transgression) is as follows:

> *Mudstone*
>
> *Monomictic (tidal flat) conglomerate with angular pebbles*
>
> *"Graphitic" greywacke*
>
> *Polymictic conglomerate with rounded pebbles.*

## W. Macdonald Gold Occurrence (6)

### Robillard Township

A quartz veined zone 150 m long has, at its western edge, a quartz vein a few cm wide cutting "birdseye" porphyry. This vein contains 0.02 ounce gold per ton (William MacDonald, personal communication, 1983). Uphill along the vein zone where it cuts grey trondhjemite containing amphibolite inclusions and strikes 050° and dips steeply southeast, assays ranging up to 0.12 ounce gold per ton were obtained (William MacDonald, Charlton, personal communication, 1983). The vein zone contains quartz, pyrite, and some carbonate. Farther northeast along this freshly backhoed and blasted trench is a lens of massive pyrite, from which selected samples contained 0.12 and 0.26 ounce gold per ton (Ontario Geological Survey, Geoscience Laboratories Report, September 14, 1983). Farther to the northeast is a chalcopyrite-bearing quartz vein <50 cm wide, from which a grab sample yielded 0.78 ounce gold per ton (William MacDonald, personal communication, 1983). At the pit farthest to the northeast, where the hill slopes towards Elk Lake-Charlton Highway 560, host rocks are granitic (30% quartz) and porphyritic, consisting of whitish coloured feldspar phenocrysts in a matrix of greenish black hornblende and chlorite. An assay here yielded 0.01 ounce gold per ton across 2.4 m of vein system (William MacDonald, personal communication, 1983).

## E. Maidment "Mearow" Gold Occurrence (7)

### Robillard Township

A talc-chlorite shear zone strikes 030°, dips 70° southeast, and contains quartz-carbonate-epidote vein material and rusty or "bleached" carbonate-rich wallrocks. The shear seems to parallel stratification in the mainly amphibolitic country rocks, and may represent an interflow sediment that was sheared during emplacement of the Round Lake batholith.

During current exploration, a hole 94 m long was collared in hornfels wallrocks and granitic dikes, the widest of which is 0.6 m.

Farther southwest, up the stratigraphic section, is an old pit in medium-grained black amphibolite containing 0.5% pyrite and cut by "birdseye" porphyry. This porphyry contains subhedral or rounded phenocrysts of quartz and pink feldspar <5 mm in diameter, and a little pyrite. Lenses of coarse-grained (3 mm) pyrite and whitish coloured carbonate owe their present location to metamorphic differentiation, but may represent metamorphosed interflow sediment. Metamorphic effects of the Round Lake granitic batholith are widespread, as are erratic gold contents, indicating the possibility of gold concentrations in structural traps.

## Maude Lake Gold Mines Limited "Argyll" Gold Prospect (8)

### Beatty Township

From 1917 to 1920, a decline shaft was sunk to 200 feet with levels at 100 and 200 feet, and 470 feet of lateral work. From 25 tons of ore milled, 30 ounces of gold were extracted. All the above mentioned work was done by Hill Gold Mining Company Limited and Premier Gold Mining

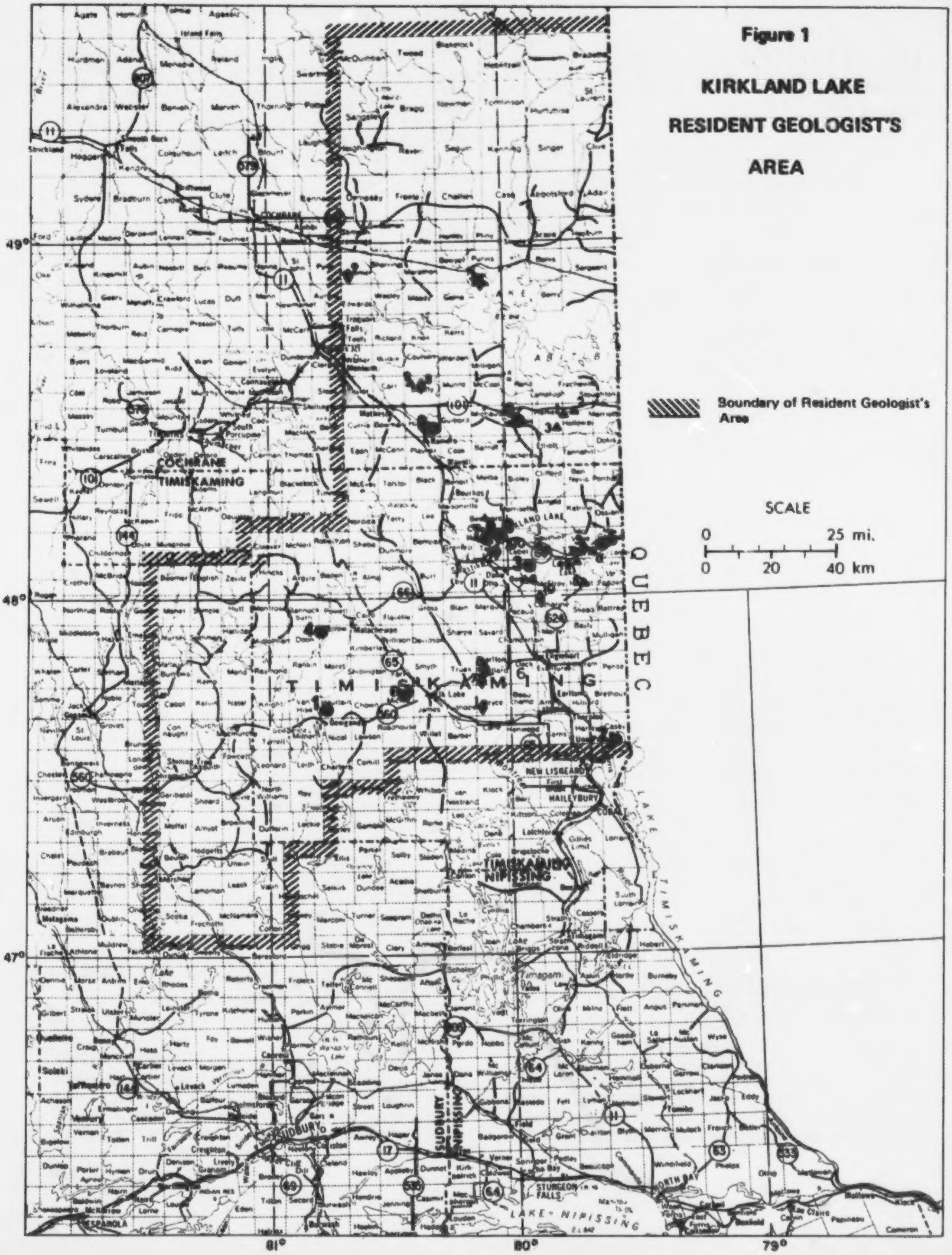


Figure 1

KIRKLAND LAKE RESIDENT GEOLOGIST'S AREA

▨ Boundary of Resident Geologist's Area

SCALE

0 25 mi.
0 20 40 km
49°
48°
47°
81°
80°
79°
QUEBEC
TIMISKAMING
COCHRANE
TIMISKAMING
TIMISKAMING
NIPISSING
SUDBURY
NIPISSING
KIRKLAND LAKE
NEW LISKEARD
HAILEYBURY
COBALT
LAKE TIMISKAMING
SUDBURY
NORTH BAY
STURGEON FALLS
LAKE NIPISSING
ESPANOLA
ABITIBI
34

● Producing Mines

| | | |
|---|---|---|
| 1. | Agnico-Eagle Mines Limited<br>Castle-Tretheway Mine | Ag, Co |
| 2. | Agnico-Eagle Mines Limited<br>Langis Mine | Ag, Co |
| 3. | Dominion Foundaries and Steel Company Limited –<br>Cliffs of Canada Limited Adams Mine | Fe |
| 4. | Extender Minerals of Canada Limited | Barite |
| 5. | Kerr Addison Mines Limited<br>Kerr Addison Mine | Au, Ag |
| 6. | Kerr Addison Mines Limited<br>Garrison Mine | Au, Ag |
| 7. | Lac Minerals Limited<br>Macassa Mine | Au, Ag |
| 8. | Lake Shore Mines Limited | Au, Ag |
| 9. | Pamour Porcupine Mines Limited<br>Ross Mine | Au, Ag, Co |

▲ Properties Under Major Evaluation

| | | |
|---|---|---|
| 1. | Camflo Mines Limited | Au |
| 2. | Canamax Resources Incorporated | Au |
| 3. | Golden Harker Explorations Limited | Au |
| 4. | Inco Limited – Queenston Gold Mines Limited<br>McBean Mine | Au |
| 5. | Lac Minerals Limited<br>Martin-Bird Mine | Au |
| 6. | Larder Resources Incorporated | Au |
| 7. | Lenora Explorations Limited | Au |
| 8. | Marshall Minerals Corporation | Au, Fe |
| 9. | Maude Lake Gold Mines Limited | Au |
| 10. | North Kirkland Mines Limited | Au |
| 11. | Silver Lake Resources Incorporated | Ag |
| 12. | Sudbury Contact Mines Limited | Au |

◆ Property Visits

| | | |
|---|---|---|
| 1. | C. Bush<br>Heather Lake | Gold Occurrence |
| 2. | M. Dyment and J. Kidston | Gold Occurrence |
| 3. | Esso Minerals Canada | Gold Occurrence |
| 4. | Lake Shore Mines Limited | Gold Occurrence |
| 5. | Lenora Exploration Limited<br>Omega Mine | Gold Past Producer |
| 6. | W. MacDonald | Gold Occurrence |
| 7. | E. Maidment<br>Mearow | Gold Occurrence |
| 8. | Maude Lake Gold Mines Limited<br>Argyll Mine | Gold Prospect |
| 9. | R. St. Denis | Gold Occurrence |
| 10. | Shenandoah Resources Incorporated | Gold Occurrence |
| 11. | Silver Lake Resources Incorporated | Silver Prospect |

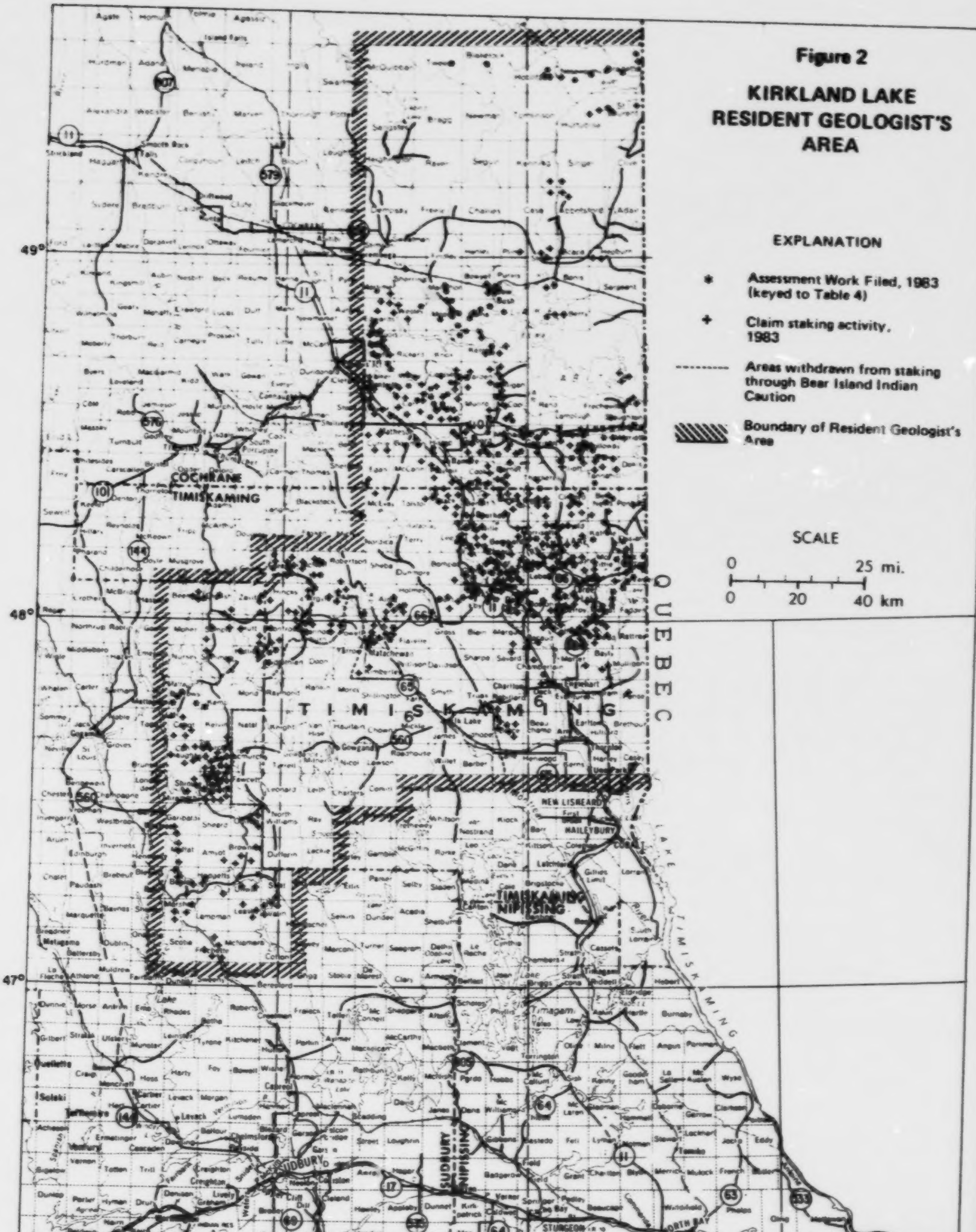
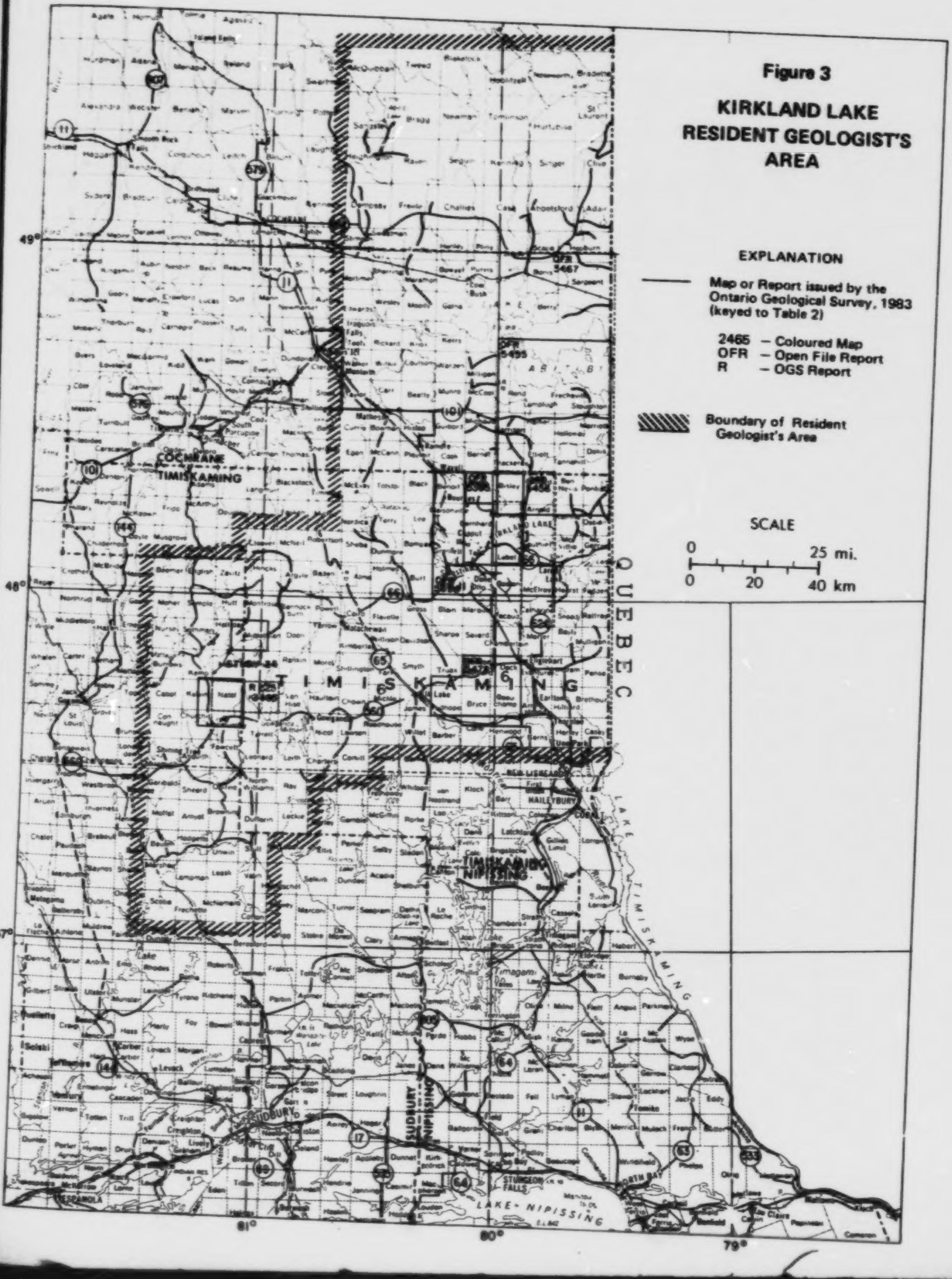


Figure 2

KIRKLAND LAKE RESIDENT GEOLOGIST'S AREA

EXPLANATION
✱ Assessment Work Filed, 1983 (keyed to Table 4)
✚ Claim staking activity, 1983
------- Areas withdrawn from staking through Bear Island Indian Caution
▨ Boundary of Resident Geologist's Area
SCALE
0 25 mi.
0 20 40 km
49°
48°
47°
81°
80°
79°
QUEBEC
TIMISKAMING
COCHRANE
TIMISKAMING
TIMISKAMING
NIPISSING
SUDBURY
NIPISSING
NEW LISKEARD
HAILEYBURY
COBALT
STURGEON FALLS
NORTH BAY
SUDBURY
ESPANOLA
LAKE NIPISSING
LAKE TIMISKAMING
Matachewan
Temagami
11
101
144
560
65
66
64
17
69
535
533
63
579
607
576


49°
48°
47°
81°
80°
79°
COCHRANE
TIMISKAMING
T I M I S K A M I N G
KIRKLAND LAKE
NEW LISKEARD
HAILEYBURY
COBALT
TIMISKAMING
NIPISSING
SUDBURY
NIPISSING
QUEBEC
LAKE TIMISKAMING
NORTH BAY
STURGEON FALLS
LAKE NIPISSING
ABITIBI
11
101
65
66
17
64
SCALE
0
25 mi.
0
20
40 km

## Figure 3

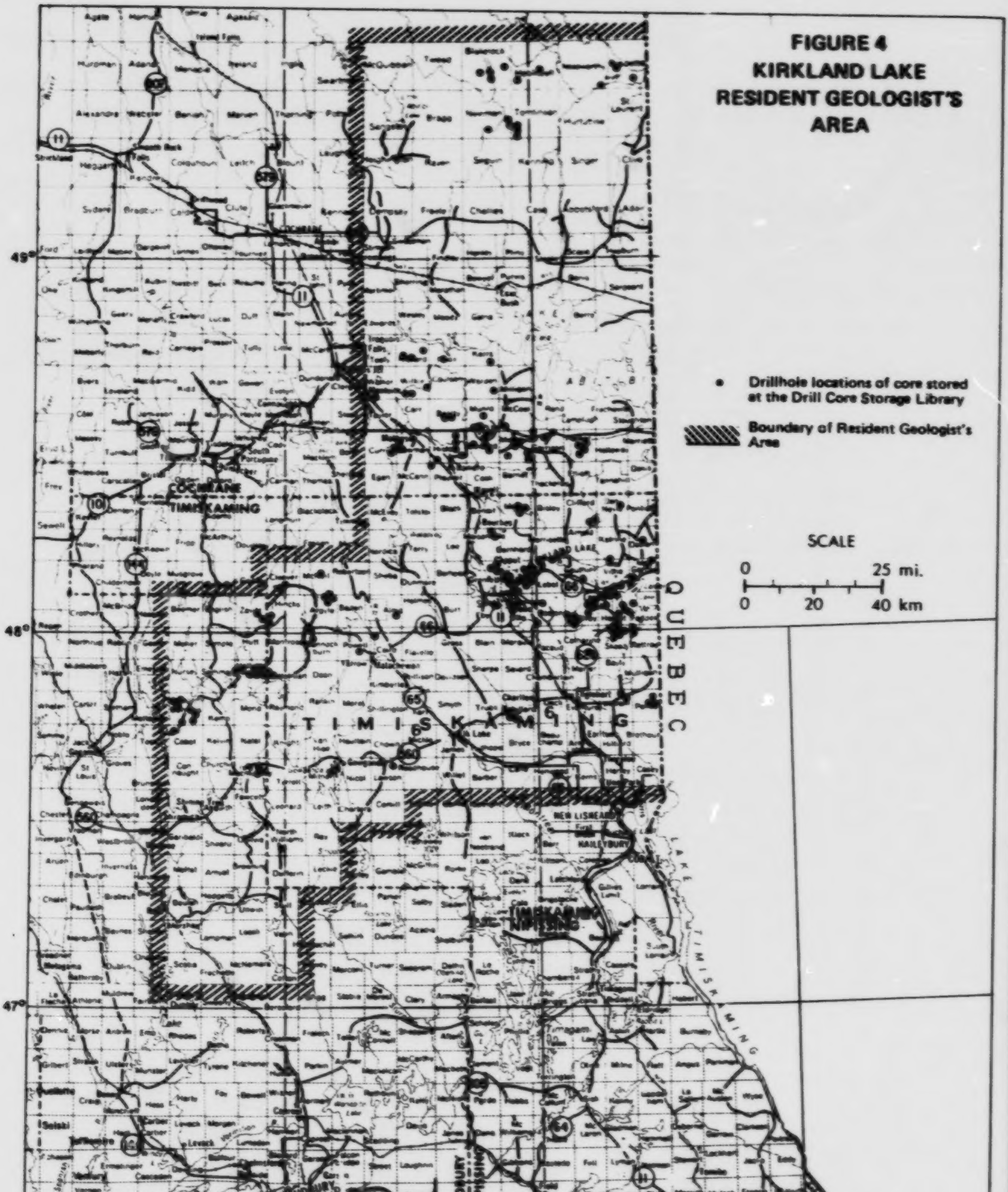
## KIRKLAND LAKE RESIDENT GEOLOGIST'S AREA

### EXPLANATION

— Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 2)

2465 – Coloured Map
OFR – Open File Report
R – OGS Report

▨ Boundary of Resident Geologist's Area



## FIGURE 4
## KIRKLAND LAKE RESIDENT GEOLOGIST'S AREA

• Drillhole locations of core stored at the Drill Core Storage Library
▨ Boundary of Resident Geologist's Area
SCALE
0 25 mi.
0 20 40 km
QUEBEC
TIMISKAMING
COCHRANE
TIMISKAMING
TIMISKAMING
NIPISSING
SUDBURY
NIPISSING
KIRKLAND LAKE
NEW LISKEARD
HAILEYBURY
COCHRANE
SUDBURY
STURGEON FALLS
NORTH BAY
ESPANOLA
LAKE TIMISKAMING
LAKE NIPISSING
49°
48°
47°
81°
80°
79°
11
101
66
65
17
64
63
144

**TABLE 3** | **GOLD PRODUCTION FROM ALL MINES IN ONTARIO'S LARDER LAKE MINING DIVISION TO THE END OF 1982 ( COMPILED BY KIRKLAND LAKE RESIDENT GEOLOGIST OFFICE )**

| Mine | Township | Tons Milled | Production (oz.) | Grade oz/T |
|---|---|---|---|---|
| Aljo | Beatty | 2,333 | 42 | 0.20 |
| American Eagle | Munro | 60 | 40 | 0.67 |
| Argyll | Beatty | 25 | 30 | 1.20 |
| Ashley | Bannockburn | 157,076 | 50,123 | 0.32 |
| Baldwin | Eby | 81 | 43 | 0.53 |
| Barry Hollinger | Pacaud | 267,741 | 77,000 | 0.26 |
| Bidgood | Lebel | 586,367 | 160,184 | 0.27 |
| Blue Quartz | Beatty | 500 | 81 | 0.16 |
| Bourkes | Benoit | 1,298 | 277 | 0.21 |
| Canadian Arrow | Hislop | 279,593 | 17,045 | 0.06 |
| Cathroy Larder | McElroy | 22,250 | 3,227 | 0.15 |
| Chesterville | McGarry | 3,260,439 | 358,880 | 0.11 |
| Croesus | Munro | 5,333 | 14,859 | 2.79 |
| Ethel Copper | James | 8,500 | 69 | 0.01 |
| Gateford (Swastika) | Teck | 103,684 | 30,068 | 0.29 |
| Golden Summit | Maisonville | 737 | 57 | 0.08 |
| Gold Hill | Catharine | 4,616 | 660 | 0.14 |
| Gold Pyramid | Guibord | 175 | 36 | 0.21 |
| Hudson-Rand | Teck | 6,496 | 483 | 0.07 |
| Kerr Addison | McGarry | 36,493,570 | 10,051,647 | 0.28 |
| Kerr Addison (Murphy) | Garrison | 70,000 | 9,000 | 0.12 |
| Kirkland Lake | Teck | 3,140,283 | 1,172,955 | 0.37 |
| Kirkland Townsite | Teck | 4,230 | 1,921 | 0.45 |
| Laguerre | McVittie | 40,514 | 7,568 | 0.19 |
| Lake Shore | Teck | 16,930,283 | 8,499,199 | 0.51 |
| Macassa | Teck | 5,661,835 | 2,465,455 | 0.44 |
| Matachewan Consolidated | Powell | 3,525,200 | 378,101 | 0.11 |
| Miller Independence | Pacaud | 31 | 59 | 1.90 |
| Moffat-Hall | Lebel | 16,388 | 4,780 | 0.29 |
| Morris Kirkland | Lebel | 127,253 | 16,999 | 0.13 |
| New Telluride | Skead | 104 | 62 | 0.60 |
| Omega | McVittie | 1,615,081 | 214,098 | 0.13 |
| Queenston | Gauthier | 1,054 | 177 | 0.17 |
| Ronda | Macmurchy | 24,592 | 2,727 | 0.11 |
| Ross | Hislop | 5,350,000 | 877,331 | 0.16 |
| Ryan Lake | Powell | 184,790 | 1,352 | 0.01 |
| Stairs | Midlothian | 15,835 | 3,573 | 0.23 |
| Sylvanite | Teck | 5,049,536 | 1,674,808 | 0.33 |
| Teck Hughes | Teck | 9,565,302 | 3,709,007 | 0.38 |
| Toburn | Teck | 1,186,316 | 570,659 | 0.48 |
| Tyranite | Tyrrell | 223,810 | 31,352 | 0.14 |
| Upper Beaver | Gauthier | 531,067 | 140,709 | 0.24 |
| Upper Canada | Gauthier | 4,648,984 | 1,398,291 | 0.30 |
| Wright Hargreaves | Teck | 9,934,327 | 4,821,296 | 0.49 |
| Young-Davidson | Powell | 6,213,272 | 585,690 | 0.10 |
| Total | | 115,260,925 | 37,321,952 | 0.32 |

and Exploration Company Limited. In 1946 and 1947, Sylvanite Gold Mines Limited diamond drilled 20 000 feet on the prospect, then owned by Argyll Gold Mines Limited. Beginning in 1981, Maude Lake Gold Mines Limited began exploratory diamond drilling and evaluation work.

In 1983, Maude Lake Gold Mines Limited stripped about 10 m of overburden (mostly glacial lake bottom varved clay) in order to mine out a bulk sample for test work at Noranda, Quebec.

Less than 50 m north of the open pit is the Pipestone Fault (strike 135°, dip northeast). Bedrock in the pit is pillow-topped, massive-based tholeiitic basalt striking southeast. In places the basalt is cut by quartz porphyry. Gold is contained in pinching and swelling altered shear zones (average 0.5 m wide) consisting of yellowish sericite, iron carbonate, fine-grained pyrite, sphalerite, tellurides, arsenopyrite, and broken fragments that strike southwest (roughly perpendicular to stratification); and also in related quartz-carbonate veins.

## R. St. Denis Gold Occurrence (9)

### Mortimer Township

Country rocks at this location are iron-rich (magnetic) tholeiitic basalt flows, somewhat banded metamorphically, and thin interflow sediments and tuffs. Schistosity strikes northwest and dips southwest; selvages indicate pillows are stretched, making top directions uncertain. Epidote-garnet-amphibolite metamorphic facies predominates, and may have generated the quartz veins that are present. A granitic batholith is thought to be located 1 to 2 km to the west. Red feldspar alteration and pink feldspar porphyry dikes are present but not abundant.

East from a north-trending dike of Matachewan diabase, a vein system extends southeastward to where it is obscured by overburden. During current exploration, the vein zone has been exposed by backhoeing. Fresh samples obtained by blasting yielded gold values (Regent St. Denis, Iroquois Falls, personal communication, 1983). Gold ore in this environment tends to be located where concentration, in part, has occurred by the thermal metamorphic effects of reddish feldspar porphyry intrusions, as at the Playfair Township "Arrow", and Garrison Township "Murphy" past producers of low grade gold ore.

## Shenandoah Resources Incorporated Gold Occurrence (10)

### Catharine Township

Along the road to Mirado Nickel Mines Limited, "Cathroy Larder" gold past producer (near the Miller Independence shafts' branch road) bulldozing and rock trenching by Shenandoah Resources Incorporated has exposed what seems to be a single dominant quartz-carbonate vein (strike east, dip 30° north). Associated with the vein and branching veinlets are blebs of visible gold in dark micaceous slips. This gold-bearing vein system extends hundreds of metres eastward along the road to the Cathroy Mine, to and perhaps beyond the area of the Hilltop shaft. The main host rock is greenish black iron-rich (magnetic) tholeiitic basalt.

Farther east, stripping by Shenandoah Resources Incorporated (in 1983), plus old trenching by Duncan Campbell and predecessors have exposed "greenstone" country rocks cut by feldspar porphyry dikes and quartz-carbonate veins, and also by north-trending, iron-rich, tholeiitic dikes commonly known as Matachewan diabase. Some of the feldspar porphyry and accompanying quartz-carbonate veins resemble auriferous counterparts of the Matachewan area. For example, pink-and-white feldspar phenocrysts 0.5 to 1.5 cm long are Carlsbad twinned "orthoclase" (perthite?), and the matrix is fine grained, brownish coloured, feldspathic material and anhedral hornblende. Quartz-carbonate veins bear pyrite and chalcopyrite. In places, pyrite has accumulated into lenses along slip planes. In most other gold areas, such lenses are not auriferous, but some here contain ore-grade gold, as do similar pyrite lenses in feldspar porphyry (syenite) and accompanying quartz-carbonate veins in places in the Matachewan-Kirkland Lake-Larder Lake area.

## Silver Lake Resources Incorporated Silver Prospect (11)

### Mickle Township

Silver veins are below the upper contact of a Nipissing Diabase basin, as is typical of silver producers in the Gowganda area . A decline ramp was driven down (18 feet per 100 feet of advance) in dog-leg configuration. Thus from the portal, which is west of and parallel to veins intersected by surface diamond drilling, the ramp trends southerly, turning easterly through the veins roughly at right angles, then resuming southward parallel to and east of the veins to 1012 feet from the portal. Here the ramp, 210 feet vertically below surface, ends with a vein zone continuing into the breast.

The portal is in "varied texture" (patchy pegmatitic and coarse-grained) Nipissing Diabase transition rock containing hornblende phenocrysts 10 cm long. At greater depth there is a coarse-grained diabase, below which, in sharp contact (but not chilled margin), is fine grained Nipissing Diabase (magnesian tholeiite). Two scoop trams haul waste muck up the ramp to the dump, and haul silver-bearing material to a stockpile where the high-grade is hand-cobbed out.

Some veins persist for considerable distances along strike, pinching and swelling (average 50 cm wide) but not curving around cylindroidal joints, which, unlike some Gowganda silver mines, are rare here. The fine grained diabase is more fractured and contains more silver. Vein material consists largely of carbonate minerals, coloured white, clear, grey, or pink, and in places, native silver, cobalt and nickel arsenides, and barite. Red hematite and green epidote are present in places in the wallrock. The company plans to drift 300 feet, including 100 feet east and 100 feet west from the bottom of the ramp, to raise along the higher grade veins, and to fan out diamond-drill holes from a station along the lower leg of the ramp.

# Ontario Geological Survey Activities

## Precambrian Geology Section

N.F. Trowell and R. Johnstone mapped Beatty and parts of Munro Townships in the second year of a multi-year program to carry out detailed, synoptic, and stratigraphic mapping along the Destor-Porcupine Fault from east of Timmins to the Quebec border. This project is part of operation Black River-Matheson (BRiM) which is equally funded by the Ontario Ministry of Northern Affairs and the Ontario Ministry of Natural Resources.

L.S. Jensen continued the stratigraphic synthesis of the Timmins-Kirkland Lake sheet by mapping the Kirkland Lake map sheet. Additional mapping was also done in the Larder Lake and Englehart areas.

## Engineering and Terrain Geology Section

U.J. Vagners mapped the Quaternary geology of the Matheson and Lightning River map areas. This project is part of Operation Black River-Matheson (BRiM) which is funded equally by the Ontario Ministry of Northern Affairs and the Ontario Ministry of Natural Resources.

D.R. Russell spent a short time mapping the Lake Timiskaming Paleozoic Outlier to complete work started in 1981.

## Geophysics-Geochemistry Section

During 1983, J.A.C. Fortescue and J. Lourim continued work on samples of overburden material collected during the Kirkland Lake Initiatives Progam (KLIP), which was a multi-year joint Federal-Provincial project that ended in 1983.

## Mineral Deposits Section

M.E. Cherry examined the petrography and petrochemistry of syenites in the Macassa mine, Kirkland Lake, and the relationship of these rocks to gold mineralization.

G.P. Watson and G. Nemcsok will produce a new compilation of the geology and mineralization of the Macassa mine, Kirkland Lake, incorporating development in the mine since publication of the last such description by G.H. Charlewood in 1964.

J.V. Hamilton initiated a study with detailed mapping of McGarry and McVittie Townships in an attempt to resolve some of the controversies about structural and stratigraphic relationships near the Kirkland Lake-Larder Lake break.

S. Marmont collected samples in the first year of a multistage age-dating program to better define some of the stratigraphic relationships extrapolated by various workers, and to obtain ages for some of the rock units that are host to gold mineralization.

# Research by Other Organizations

## Geoscience Research Grant Program

### McMaster University

J.H. Crockett, R.H. McNutt, H.P. Schwarcz, C.E. Rees, N. Blum, T. Hurley, R. Bowins, and A. Kabir: Genesis of Precambrian Iron Formations—Links with Base and Precious Metal Mineralization

### University of Toronto

D.W. Strangway, O.M. Ilkisik, and J.D. Redman: Surface Electromagnetic Mapping in Selected Positions in Northern Ontario

F.W. Wicks, E.S. Schandl, J. Ozoray, and W. Pu: Mineralization and Gechemistry of the Chrysotile Asbestos Deposits of Ontario

### University of Windsor

D.T.A. Symons and M. Stupavsky: Analysis of Aeromagnetic Anomalies over Algoman-Type Iron Formations

# Selected Recent References

Aarnisalo, J., Eeronheimo, J., Lakanen, E., and Pehkonen, E.
1982: On the Integrated Use of LANDSAT, Geophysical and Other Data in Exploration in the Baltic Shield, Finland; The Photogrammetric Journal of Finland, Volume 9, Number 1, p.48-64.

Andrews, J.T., Shilts, W.W., and Miller, G.H.
1983: Multiple Deglaciations of the Hudson Bay Lowlands, Canada, Since Deposition of the Missinaibi (Last-Interglacial?) Formation; Quaternary Research, Volume 19, Number 1, p.18-37.

Arndt, N.T.
1983: Role of a Thin, Komatiite-Rich Oceanic Crust in the Archean Plate Tectonic Process; Geology, Volume 11, Number 7, p.372-375.

(References continued on p.165)

## TABLE 4 ASSESSMENT WORK AND OTHER INFORMATION RECEIVED

### ABBREVIATIONS

A - Airborne Survey
AEM - Airborne Electromagnetic Survey
AMag - Airborne Magnetometer Survey
Assess - Assessment Work
CS - Core Samples

D - Donated by Company or Individual
DD - Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled respectively).
EM - Electromagnetic Survey
GL - Geological Survey
HLEM - Horizontal Loop Electromagnetic Survey
IP - Induced Polarization Survey
Mag - Magnetometer Survey
OVB - Overburden Drilling (the numbers following "OVB" indicate the the number of holes drilled and the total length respectively).
OSC - Ontario Securities Commission
Pros - Prospectus
Rad - Radiometric Survey
SA - Sampling, Assays
rTr - Rock Trenching
VEM - Vertical Loop Electromagnetic Survey
VLF - Very Low Frequency

### MINERAL AND METAL SYMBOLS

Au - Gold
Ag - Silver
Cu - Copper
Mo - Molybdenum
Co - Cobalt
BM - Base Metals

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Argyle | 42A/02 | Carlson,H.D. | Au | Assess | VLF-EM | 1982 | 2.4716 |
| Argyle | 42A/02 | Fox,P. | Au | Assess | rTr | 1982 | |
| Argyle | 42A/02 | Petromet Resources Ltd.<br>"Ashley Property" | Au | Assess | STr SA<br>STr SA GL | 1981<br>1982 | 2.5004<br>2.5300 |
| Arnold | 32D/04 | Merrick,A.; Link,T. | Au | Assess | DD (5) 3173' | 1983 | |
| Asquith | 41P/11 | Forbes, C.P. | Au | Assess | STr rTr | 1983 | |
| Asquith | 41P/11 | Patino Mines (Quebec) Ltd.<br>"Mera Lake Property" | Au | Assess | Mag VLF-EM | 1981 | 2.4444 |
| Asquith | 41P/11 | Patino Mines (Quebec) Ltd.<br>"Seeger Lake Group" | Au | Assess | GL | 1981 | 2.4363 |
| Asquith | 41P/11 | Sullivan,M.J. | Au | Assess | STr | 1982 | |
| Asquith & Churchill | 41P/11 | Timmins Gold Resources Ltd.<br>"Annett Option" | Au | Assess | DD (2) 250' | 1982 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Asquith | 41P/11 | Timmins Gold Resources Ltd.<br>"Gibson Property" | Au | Assess | DD (3) 789′ | 1982 | |
| Asquith | 41P/11 | Timmins Gold Resources Ltd.<br>"Jesse James Property" | Au | Assess | VLF-EM | 1982 | 2.4746 |
| Asquith | 41P/11 | Timmins Gold Resources Ltd.<br>"Shiningtree 1 Property" | Au | Assess | DD (2) 673′ | 1981 | |
| Baden | 42A/07 | Odin Gold Corp. | Au | Assess | STr rTr | 1983 | |
| Bannockburn | 41P/15 | Johns-Manville Canada Inc. | Au | Assess | Mag VEM | 1981 | 2.4414 |
| Bannockburn | 42A/02 | Petromet Resources Ltd.<br>"Ashley Property" | Au | Assess | Mag VLF-EM<br>Mag VLF-EM | 1982<br>1982 | 2.4540<br>2.4541 |
| Bannockburn | 41P/15 | Quevillon, G. | Au | Assess | STr | 1983 | |
| Bannockburn & Montrose | 41P/15 | Rahn Lake Mines Corp. Ltd. | Au | D | Information Circular | 1930 | |
| Barnet | 42A/08 | Noranda Exploration Co.Ltd.<br>"1-82" | Au | Assess | OVD (23) 490′ | 1983 | 2.5492 |
| Barnet | 42A/08 | St. Joe Canada Inc. | Au | Assess | OVD (60) 4139′ | 1982 | 2.5330 |
| Beatty & Coulson | 42A/09 | Dalhousie Oil Corporation | Au | Assess | DD (5) 2156′ | 1982 | |
| Beatty | 42A/09 | Lalonde, D. | Au | Assess | STr rTr | 1982 | |
| Beatty | 42A/09 | Lynco Resources Inc. | Au | Assess | Mag VLF-EM | 1982 | 2.4661 |
| Beatty | 42A/09 | Maude Lake Gold Mines Ltd.<br>"Main Group" | Au | Assess | VLF-EM<br>Mag GL | 1982<br>1981 | 2.5085<br>2.4466 |
| Beatty | 42A/09 | Maude Lake Gold Mines Ltd.<br>"Salve Lake Group" | Au | Assess | Mag<br>GL VLF-EM | 1981<br>1982 | 2.4520<br>2.5080 |
| Beatty | 42A/09 | Maude Lake Gold Mines Ltd<br>"Salve South Group" | Au | Assess | Mag VLF-EM Rad | 1983 | 2.5570 |
| Beatty | 42A/09 | Maude Lake Gold Mines Ltd<br>"Salve West Group" | Au | Assess | DD (2) 1163′<br>GL Mag VLF-EM Rad | 1983<br>1983 | <br>2.5571 |
| Beatty | 42A/09 | Parsons, G.E. | Au | Assess | Mag<br>VLF-EM<br>GL | 1982<br>1982<br>1982 | 2.5157<br>2.5156<br>2.5158 |
| Beatty | 42A/09 | Ward, J.T. | Au | Assess | VLF-EM<br>VLF-EM | 1982 | 2.5320<br>2.5600 |
| Boomer | 42A/03 | Amax Minerals Exploration<br>"English-1" | Au | Assess | GL<br>AMag AEM | 1982<br>1983 | 2.5163<br>2.5300 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Ben Nevis | 32D/05 | Harper, H.G.<br>"Goldmac Explorations Inc." | Au | Assess | DD (5) 1269'<br>GL Rad | 1982<br>1982 | <br>2.4987 |
| Ben Nevis | 32D/05 | Lacana Mining Corporation<br>"James Option" | Au | Assess | Mag VLF-EM | 1981 | 2.4177 |
| Benoit | 42A/08 | Ward, J.T. | Au BM | Assess | Mag VLF-EM | 1982 | 2.4753 |
| Bisley | 32D/05 | Noranda Exploration Co. Ltd.<br>"Thackeray 2-79" | BM Au | Assess | DD (1) 446' | 1982 | |
| Black | 42A/08 | Gray, M. | Au | Assess | STr rTr<br>DD (1) 104' | 1983<br>1983 | |
| Black | 42A/08 | Wright, A. | Au | Assess | VLF-EM | 1981 | 2.4189 |
| Blakelock & Tweed | 42H/08 | Utah Mines Limited | BM | Assess | Mag HLEM | 1982 | 2.4963 |
| Bompas | 42A/01 | St. Joe Canada Inc. | Au | Assess | GL | 1983 | 2.5396 |
| Boston | 32D/04 | Dominion Foundaries and Steel Ltd. | Au | Assess | DD (1) 320' | 1982 | |
| Boston | 32D/04 | Falconbridge Nickel Mines Ltd. | Au | Assess | Mag | 1981 | 2.4397 |
| Boston | 32D/04 | Geological Engineering Services<br>"Tagliamonte Claim" | Au | Assess | Mag VLF-EM | 1983 | 2.5385 |
| Boston | 32D/04 | Marshall-Boston Iron Mines Ltd. | BM<br>Fe | Assess<br>Assess | VLF-EM<br>Mag | 1981<br>1982 | 2.4171<br>2.5093 |
| Boston | 32D/04 | Marshall-Boston Iron Mines Ltd.<br>"North Group" | Fe Au | Assess | DD (2) 580' | 1982 | |
| Boston | 32D/04 | Martin, T. | W Au | Assess | rTr | 1982 | |
| Bowman | 42A/08 | Asarco Exploration Co. of Canada Ltd.<br>"Cook Project" | Au | Assess | OVD (2) 124' | 1982 | 2.5196 |
| Bowman | 42A/08 | Asarco Exploration Co. of Canada Ltd.<br>"Vimy Ridge Project" | Au | Assess | HLEM Mag<br>GL | 1982<br>1982 | 2.5055<br>2.5207 |
| Bowman & Currie | 42A/07 | Kidd Creek Mines, Ltd. | Au | Assess | AMag AEM | 1982 | 2.5231 |
| Bowman | 42A/07 | Tillex Syndicate<br>"Group -1 Bowman" | Au Cu | D | DD (3) 1044' | 1976 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Bowyer, Galna, Moody & Marathon | 42A/15 | Noranda Exploration Co. Ltd. "Moody 1-81 & Galna 1-81" | Au BM | Assess | AMag AEM | 1982 | 2.4879 |
| Bowyer, Chesney Bay, Galna & Purvis | 42A/16 | Noranda Exploration Co. Ltd. "Bowyer 2-82" | BM Au | Assess | AMag AEM | 1982 | 2.5207 |
| Bradette | 32E/12 | Canadian Nickel Co. Ltd | Au | Assess | Mag | 1983 | 2.5520 |
| Bradette | 32E/05<br>32E/12 | Noranda Exploration Co. Ltd. "Bradette 1-82" | Au | Assess | Mag HLEM | 1983 | 2.5486 |
| Bradette | 32E/12 | Noranda Exploration Co. Ltd. "1-80" | BM Au | Assess | DD (1) 605′ | 1982 | |
| Bradetto | 32E/12 | Noranda Exploration Co. Ltd. "2-80" | BM Au | Assess | DD (2) 949′ | 1982 | |
| Browning, Stull & Unwin | 41P/06 | Patino Mines (Quebec) Ltd. | Au | Assess | Mag VLF-EM | 1981 | 2.4363 |
| Bryce | 41P/09 | Yvanex Developments Ltd. & Windjammer Power & Gas Ltd. | Au | Assess | GL | 1982 | 2.5007 |
| Burrows & Kemp | 41P/14 | Newmont Exploration of Canada Ltd. "Sirola-Karvinen option" | Au BM | Assess | DD (10) 5298′ CS | 1982 | |
| | | | | | VLF-EM STr Mag | 1983 | 2.5147 |
| | | | | | Gc | 1982 | 2.5130 |
| | | | | | GL | 1982 | 2.5106 |
| | | | | | IP | 1982 | 2.5144 |
| | | | | | Res | 1982 | 2.5145 |
| Cairo | 41P/15 | Cairo Resources Inc. | Au | Assess | rTr | 1982 | |
| Cairo | 41P/15 | Minerex Limited "Hansen-Welsh Option" | Au | Assess | Mag GL VLF-EM | 1981 | 2.4103 |
| Cairo | 41P/15 | North Expo Mines Ltd. | Au | D Pros. | DD (3) 1001′ SP Mag | 1966 | |
| Cairo | 41P/15 | Pamour Porcupine Mines Ltd. "Northeast Group" | Au | Assess | VLF-EM | 1982 | 2.5139 |
| | | | | | GL | 1982 | 2.4490 |
| Cairo | 41P/15 | Pamour Porcupine Mines Ltd. "Webb Lake Group" | Au | Assess | Mag | 1982 | 2.4701 |
| | | | | | Mag | 1982 | 2.4724 |
| | | | | | VLF-EM | 1982 | 2.4699 |
| | | | | | GL Gc | 1982 | 2.5010 |
| | | | | | Gc | 1982 | 2.5140 |
| Cairo | 41P/15 | Pyke, D.R. | Au | Assess | Gc | 1982 | 2.4973 |
| Carr | 42A/09 | Asarco Exploration Co. of Canada Ltd. | Au | Assess | OVD (5) 542′ | 1982 | 2.5195 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Carr & Wilkie | 42A/09 | Pyke, D.R. | Au | Assess | Gc<br>Mag | 1981<br>1981 | 2.4283<br>2.4451 |
| Catherine | 31M/13 | Kennco Expl. (Canada)Ltd. "Ostrom Gold Project" | Au | Assess | Mag VLF-EM | 1981 | 2.4442 |
| Catherine | 31M/13 | Laing, D. | Au | Assess | STr | 1976 | |
| Catherine | 31M/13 | Link, D.S. | Au | Assess | DD (2) 985' | 1982 | |
| Catherine | 31M/13 | Perron, A.H. "Benson West Grid" | Au | Assess | Mag VLF-EM | 1982 | 2.4504 |
| Catherine | 32D/04 | Perron, A.H. "Number 6 Group" | Au | Assess | Mag VLF-EM | 1982 | 2.4530 |
| Chamberlain | 31M/13 | Kapuskasing Resources Ltd. | Au | Assess | Rad VLF-EM Mag GL | 1982 | 2.4940 |
| Chesney Bay, Galna, Northeast Bay, Purvis, Sulphur Island | 32D/13<br>42A/16 | Esso Minerals Canada | BM Au | Assess | AMag<br>DD (56) 2971' | 1982<br>1983 | 2.4488<br>2.5351 |
| Chesney Bay | 42A/16 | Noranda Exploration Co. Ltd. "Bowyer 2-82" | BM Au | SEE UNDER BOWYER TOWNSHIP | | | |
| Chesney Bay & Kerrs | 42A/15 | Noranda Exploration Co. Ltd. "Kerrs 1-77" | Au | Assess | A-Mag, AEM<br>Mag HLEM<br>DD (10) 7325' | 1982<br>1982<br>1982 | 2.4788<br>2.5252 |
| Churchill | 41P/11 | Cashaback, A. | Au | Assess | rTr STr | 1983 | |
| Churchill | 41P/11 | Leblanc, G. | Au | Assess | Mag | 1983 | 2.5638 |
| Churchill | 41P/11 | Shiningtree Gold Resources Inc. | Au | Assess | STr SA<br>DD (1) 782' | 1982<br>1983 | 2.4840 |
| Churchill | 41P/11 | Texasgulf Canada Inc. "Churchill 31 & 42" | Au | Assess | Mag HLEM VLF-EM | 1981 | 2.4178 |
| Churchill | 41P/11 | Timmins Gold Resources Ltd. "Annett Option" | Au | SEE UNDER ASQUITH TOWNSHIP | | | |
| Churchill | 41P/11 | Timmins Gold Resources Ltd. "Beilby Lake Property" | Au | Assess | VLF-EM | 1982 | 2.5181 |
| Churchill | 41P/11 | Vellow, P. | Au | Assess | rTr | 1982 | |
| Cleaver | 42A/03<br>42A/02 | Comstate Resources Ltd. | Au | Assess | Mag VLF-EM<br>Mag VLF-EM | 1982<br>1982 | 2.4763<br>2.4762 |
| Cleaver | 42A/03 | Noranda Expl. Co. Ltd. "1-80" | Au BM | Assess | Mag HLEM | 1981 | 2.4423 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Connaught | 41P/11 | Goldhurst Resources Inc. | Cu | Assess | Mag | 1982 | 2.4490 |
| Connaught | 41P/11 | Texasgulf Canada Ltd. | BM Au | Assess | VLF-EM Mag HLEM | 1981 | 2.4178 |
| Coulson & Warden | 42A/09 | Canamax Resources Inc. | Au | Assess | AMag | 1983 | 2.5632 |
| Coulson | 42A/09 | Dalhousie Oil Corporation | Au | SEE UNDER BEATTY TOWNSHIP | | | |
| Coulson | 42A/09 | Hollinger Argus Ltd | Au | Assess | VLF-EM | 1983 | 2.5687 |
| Coulson | 42A/09 | Maude Lake Gold Mines Ltd. "Coulson Group" | Au | Assess | Mag GL VLF-EM | 1982 | 2.5087 |
| Currie | 42A/07 | Tillex Syndicate "Group-1 Currie" | Au Cu | D | DD (31) 13,510′ | 1976 | |
| Currie | 42A/07 | Kidd Creek Mines Ltd. | Au | SEE UNDER BOWMAN TOWNSHIP | | | |
| Dack | 31M/13 | Mowat, A. | Au<br>Au | Assess<br>Assess | Mag<br>Mag VLF-EM Rad | 1982<br>1982 | 2.4991<br>2.5020 |
| Eby & Otto | 42A/01 | Lenora Exploration Limited | Au | Assess | AMag AEM | 1983 | 2.5481 |
| Eby & Otto | 42A/01 | Reed, J.D. | Au | Assess | Mag VLF-EM<br>Rad<br>Rad | 1981<br>1982<br>1982 | 2.4680<br>2.5067<br>2.5068 |
| Edwards & Teefy | 42A/10<br>42A/15 | Canamax Resources Inc. | Au | Assess | AMag | 1983 | 2.5631 |
| Egan | 42A/07 | Johns-Manville Canada Inc. | Au | Assess | Mag GL VEM | 1983 | 2.5500 |
| Elliott | 32D/05 | Perron, A.H. | Au | Assess | VLF-EM Mag | 1982 | 2.4529 |
| Elliott | 32D/05 | Phelps-Dodge of Canada Ltd. | Au BM | Assess | VLF-EM | 1982 | 2.4630 |
| Elliott | 32D/05 | Randa, T. | Au | Assess | GL<br>SA | 1980 | 2.4506<br>2.4621 |
| English | 42A/03 | Amax Minerals Exploration "English-1" | Au | SEE UNDER BEEMER TOWNSHIP | | | |
| English & Semple | 41P/14<br>42A/03 | Amax Minerals Exploration "English-2" | Au | Assess | GL | 1982 | 2.5169 |
| English | 42A/03 | Amax Minerals Exploration "English-3" | Au | Assess | GL | 1982 | 2.5225 |
| Galna & Kerrs | 42A/16 | Dome Exploration (Can.) Ltd. "125A" | Au | Assess | OVD (9) 1594′ | 1982 | 2.4945 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Galna | 32D/13<br>42A/16 | Esso Minerals Canada | BM Au | SEE UNDER CHESNEY TWP | | | |
| Galna | 42A/16 | Noranda Exploration Co. Ltd. "Bowyer 2-82" | BM Au | SEE UNDER BOWYER TOWNSHIP | | | |
| Galna | 42A/15 | Noranda Exploration Co. Ltd. "Moody 1-81 & Galna 1-81" | BM Au | SEE UNDER BOWYER TOWNSHIP | | | |
| Galna, Moody, Kerrs & Knox | 42A/16 | Utah Mines Limited "Jim's Lake Property" | Au | Assess | OVD (23) 4590′ | 1982 | 2.4654 |
| | | | | | Mag | 1982 | 2.4579 |
| | | | | | OVD (25) 4337′ | 1983 | 2.5400 |
| | | | | | Mag EM | 1983 | 2.5532 |
| | | | | | DD (7) 8317′ | 1983 | |
| | | | | | AEM | 1982 | 2.4591 |
| | | | | | AMag | 1982 | 2.4592 |
| | | | | | Mag | 1982 | 2.4691 |
| Garrison | 32D/05 | Moses, J.R. | Au | Assess | DD (3) 3059′ | 1983 | |
| Gauthier | 32D/04 | Casam Mining Ltd. | Au | Assess | Gc | 1982 | 2.5210 |
| | | | | | Rad | 1982 | 2.5211 |
| | | | | | STr | 1982 | |
| Gauthier & Lebel | 32D/04 | Hoffman Exploration & Minerals Limited | Au Mo | Assess | Gc | 1981 | 2.4446 |
| | | | | | SA | 1982 | 2.5350 |
| | | | | | Mag VLF-EM | 1981 | 2.4445 |
| | | | | | GL | 1983 | 2.5691 |
| Gauthier | 32D/04 | Leahy, M. | Au | Assess | SA | 1982 | 2.5317 |
| Gauthier | 32D/04 | MacGregor, R.A. | Au | Assess | GL | 1982 | 2.5134 |
| Gauthier | 32D/04 | Perron, A.H. "Northland Grid" | Au | Assess | GL | 1983 | 2.5695 |
| | | | | | VLF-EM Mag | 1982 | 2.4964 |
| Gauthier | 32D/04 | Tower Gold Resources Ltd. "Northland Group" | Au | Assess | GL | 1983 | 2.5602 |
| Gauthier | 32D/04 | Tower Gold Resources Ltd. "Moose Crossing & Kokotow Groups" | Au | Assess | GL Mag Rad VLF-EM | 1981 | 2.4260 |
| Grenfell | 42A/01 | Hurd, D.F. | Au | Assess | Mag VLF-EM Rad | 1982 | 2.4700 |
| | | | | | rTr | 1983 | |
| Grenfell | 42A/01 | Lampe Resources Co. Ltd. "Stitt Option" | Au | Assess | Mag | 1981 | 2.4192 |
| Grenfell & | 42A/01 | Minorex Ltd. "Kapakita Creek Property" | Au | Assess | Mag VLF-EM GL Gc | 1982 | 2.4676 |
| Grenfell | 42A/01 | Perron, A.H. "One Man Mine Claim" | Au | Assess | GL | 1983 | 2.5734 |
| | | | | | VLF-EM Mag | 1983 | 2.5390 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Grenfell | 42A/01 | Perron, A.H.<br>"Perron-Grenfell Grid" | Au | Assess | Mag VLF-EM | 1983 | 2.5545 |
| Guibord | 42A/08 | Armco Mineral Expl. Ltd.<br>"Main Property Group" | Au | Assess | GL | 1982 | 2.5209 |
| | | | | | VLF-EM | 1982 | 2.4920 |
| | | | | | DD (7) 3001′ | 1982 | |
| | | | | | VLF-EM | 1983 | 2.5462 |
| | | | | | VLF-EM | 1983 | 2.5573 |
| | | | | | SA | 1983 | 2.451 |
| | | | | | Mag VLF-EM | 1983 | 2.4959 |
| Guibord | 42A/08 | Armco Mineral Expl. Ltd<br>"Parsons Property" | Au | Assess | Mag | 1982 | 2.5305 |
| Guibord | 42A/08 | Armco Mineral Expl. Ltd<br>"Road Property" | Au | Assess | OVD (16) 1278′ | 1982 | 2.5349 |
| Guibord | 42A/08 | Cominco Ltd.<br>"Gib Property" | Au | Assess | SA | 1981 | |
| | | | | | OVD (70) 3183′ | 1981 | |
| Guibord & Michaud | 42A/08 | Gold Fields Canadian Mining Limited | Au | Assess | Mag VLF-EM | 1982 | 2.4787 |
| Guibord | 42A/08 | Johns-Manville Canada Ltd.<br>"Joseph-Group" | Au | Assess | DD (2) 204′ rTr | 1982 | |
| | | | | | SA | 1983 | 2.5466 |
| Guibord | 42A/08 | Kerr Addison Mines Ltd. | Au | Assess | Mag VLF-EM | 1982 | 2.4897 |
| | | | | | GL | 1982 | 2.5289 |
| | | | | | VLF-EM | 1982 | 2.4953 |
| Halliday | 41P/14 | Chevron Standard Ltd. | BM Au | Assess | DD (4) 1861′ | 1982 | |
| | | | | | DD (6) 2582′ | 1983 | |
| Halliday | 41P/14 | Norcen Energy Resources Ltd. | BM Au | Assess | AEM | 1981 | 2.4274 |
| Harker | 32D/12 | Amax Minerals Exploration<br>"Harker-1" | Au | Assess | DD (2) 304′ | 1983 | |
| Harker | 32D/12 | Amax Minerals Exploration<br>"Harker-3" | Au | Assess | DD (2) 1073′ | 1982 | |
| Harker | 32D/12 | Amax Minerals Exploration<br>"Harker-4" | Au | Assess | DD (5) 2168′ | 1982 | |
| Harker & Holloway | 32D/05<br>32D/12 | Canadian Nickel Co. Ltd. | Au BM | Assess | AMag AEM | 1982 | 2.4686 |
| Harker | 32D/12 | Canamax Resources Inc.<br>"Harker-5, Union Option" | Au | Assess | GL | 1983 | 2.5582 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Harker | 32D/05 | Harley, N. | Au | Assess | EM Mag | 1982 | 2.5301 |
| Harker | 32D/05 | Hurd, D.E. | Au | Assess | rTr Mag<br>Mag | 1982<br>1982 | 2.5045<br>2.4957 |
| Harker | 32D/12 | Johns-Manville Canada Inc.<br>"Harker Lake-East Extension" | Au | Assess | VEM Mag<br>Mag VEM | 1982<br>1981 | 2.4682<br>2.4582 |
| Harker | 32D/12 | Neal, H.E. | Au | Assess | GL | 1982 | 2.5245 |
| Harker | 32D/05 | Phelps Dodge Corporation of Canada, Limited<br>"Grid-A" | Au | Assess | VLF-EM<br>DD (1) 120′<br>GL | 1981<br>1982<br>1982 | 2.4581<br><br>2.4923 |
| Harker & Holloway | 32D/05 | Phelps-Dodge Corp. of Canada Ltd.<br>"Grid B " | Au | Assess | VLF-EM<br>GL | 1981<br>1982 | 2.4485<br>2.4924 |
| Harker | 32D/12 | Union Mining Corp. | Au | Assess | Mag VLF-EM | 1981 | 2.4471 |
| Hearst & Skead | 31M/13 | Canadian Nickel Co. Ltd. | Au | Assess | Mag | 1981 | 2.4155 |
| Hearst, McGarry & McFadden | 32D/04 | Canadian Nickel Co., Ltd.<br>"MacGregor Property" | Au | Assess | Mag<br>DD (1) 224′<br>SA | 1982<br>1982<br>1982 | 2.4878<br><br>2.5241 |
| Hearst | 32D/04 | Combined Larder Mines Ltd. | Au | Assess | Mag VLF-EM | 1982 | 2.4640 |
| Hearst | 32D/04 | Falconbridge Copper Corp.<br>"Estrangement Lake Property" | BM Au | Assess | HLEM | 1980 | 2.4404 |
| Hearst | 32D/04 | Hemlar Resource Expl. Ltd. | Au | Assess | DD (4) 1204′ | 1983 | |
| Hearst | 32D/04 | Hinton, D.M. | Au | Assess | GL<br>Rad | 1981 | 2.4451<br>2.4452 |
| Hearst | 32D/04 | Hummingbird Resources Ltd. | Au | Assess | VLF-EM Mag | 1982 | 2.5459 |
| Hearst | 32D/04 | Lac Minerals Ltd. | Au | Assess | STr<br>STr | 1981<br>1983 | |
| Hearst | 32D/04 | MacGregor, R.A.<br>"Benson Creek North" | Au | Assess | VLF-EM | 1982 | 2.5070 |
| Hearst & Skead | 32D/04<br>31M/13 | MacGregor, R.A.<br>"Grace Lake Baseline" | Au | Assess | GL<br>VLF-EM<br>Mag VLF-EM<br>GL | 1982<br>1981<br>1982<br>1981 | 2.5243<br>2.4377<br>2.4524<br>2.4156 |
| Hearst | 32D/04 | MacGregor, R.A.<br>"Group 2 East" | Au | Assess | DD (4) 4456′ | 1980 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Hearst | 32D/04 | MacGregor, R.A. "Martin Bird North" | Au | Assess | VLF-EM | 1981 | 2.3920 |
| Hearst & McFadden | 32D/04 | MacGregor, R.A. "Martin Bird South" | Au | Assess | VLF-EM<br>VLF-EM<br>GL<br>VLF-EM | 1981<br>1981<br>1982<br>1981 | 2.5463<br>2.4497<br>2.5257<br>2.3922 |
| Hearst | 32D/04 | MacGregor, R.A. "South Grid A-1" | Au | Assess | GL<br>GL | 1982<br>1982 | 2.5256<br>2.5094 |
| Hearst | 32D/13<br>32D/04 | Noranda Exploration C. Ltd. "MacGregor Option" | Au | Assess | VLF-EM | 1982 | 2.4523 |
| Hearst | 32D/04 | Rivard, F | Au | Assess | STr | 1982 | |
| Hearst & McFadden | 32D/04 | San Rafael Resources Ltd. | Au | Assess | VLF-EM | 1982 | 2.5300 |
| Hearst | 32D/04 | Sudbury Contact Mines Ltd. | Au | Assess | DD (9) 3430′ | 1980 | |
| Hislop | 42A/08 | Pamour Porcupine Mines Ltd. | Au | Assess | VLF-EM | 1982 | 2.5141 |
| Hislop | 42A/08 | Parsons, G.E. | Au | Assess | Mag VLF-EM | 1982 | 2.5119 |
| Hoblitzell | 32E/12 | Dome Exploration Canada Ltd. "165-C" | Au BM | Assess | DD (1) 495′ | 1982 | |
| Hodgetts | 41P/06 | H.T. Investments, Limited "Raven Creek Property" | Au | Assess | VLF-EM Mag | 1981 | 2.4255 |
| Holloway | 32D/12 | Amax Minerals Exploration "Holloway-2" | Au | Assess | DD (12) 7017′ | 1982 | |
| Holloway | 32D/05<br>32D/12 | Canadian Nickel Co. Ltd. | Au BM | SEE UNDER HARKER TOWNSHIP | | | |
| Holloway & Tannahill | 32D/05 | Canamax Resources Inc. "Bastarache-Mathias Option" | Au | Assess | DD (4) | 1983 | |
| Holloway | 32D/12<br>32D/05 | Johns-Manville Canada Inc. | Au | Assess | DD (3) 1932′<br>VEM Mag | 1983<br>1982 | <br>2.5343 |
| Holloway | 32D/12 | Neal, H.E. "101 Group" | Au | Assess | GL<br>VLF-EM<br>Mag VLF-EM | 1982<br>1982<br>1982 | 2.5200<br>2.5204<br>2.4951 |
| Holloway | 32D/05 | Phelps-Dodge Corp. of Canada Ltd. | Au | SEE UNDER HARKER TOWNSHIP | | | |
| Holmes | 42A/02 | Dea, A. | Au | Assess | STr rTr | 1983 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Holmes | 42A/12 | Rio Tinto Canadian Exploration, Limited "Cunningham Claims" | Au | Assess | GL | 1982 | 2.4718 |
| Hurtubise & St. Laurent | 32E/05 | Newmont Exploration of Canada, Limited "Patten River Group" | Au BM | Assess | AMag AEM | 1983 | 2.5529 |
| Katrine | 32D/04 | Cunningham, L.J. | Au | Assess | GL | 1982 | 2.5356 |
| Katrine | 32D/05 | Kiazyk, B. | Au | Assess | Str rTr<br>Str rTr | 1983<br>1983 | |
| Katrine & Ossian | 32D/04 | Rock Ore Exploration & Development Limited | Au | Assess | Mag VLF-EM<br>Mag VLF-EM<br>STr | <br>1982<br>1982 | 2.4639<br>2.4641 |
| Katrine | 32D/04 | Swansea Gold Mines Inc. | Au | Assess | Mag | 1982 | 2.4585 |
| Kamp | 41P/14 | Newmont Expl. of Can. Ltd. "Sirola-Karvinen Option" | Au | SEE UNDER BURROWS TOWNSHIP | | | |
| Kerrs | 42A/16 | Dome Exploration (Can.) Ltd. "125A" | Au | SEE UNDER GALNA TOWNSHIP | | | |
| Kerrs | 42A/16 | Dome Exploration Can. Ltd. "Camp Creek Option" "125B" | Au | Assess | DD (12) 1327' | 1982 | 2.4946 |
| Kerrs & Warden | 42A/09 | Dome Exploration Can. Ltd. "Denison Option" "170" | Au | Assess | DD (8) 1257' | 1982 | 2.4946 |
| Kerrs | 42A/15 | Noranda Exploration Co. Ltd. "Kerrs 1-77" | Au | SEE UNDER CHESNEY BAY | | | |
| Kerrs | 42A/16 | Utah Mines Limited "Jim's Lake Property" | Au | SEE UNDER GALNA TOWNSHIP | | | |
| Knox | 42A/16 | Utah Mines Limited "Jim's Lake Property" | Au | SEE UNDER GALNA TOWNSHIP | | | |
| Lebel | 32D/04 | Cherzopa, E. | Au | Assess | DD (1) 122' | 1983 | |
| Lebel | 32D/04 | Forbes, C. & Leahy, M. | Au | Assess | UG | 1982 | |
| Lebel | 32D/04 | Hoffman Exploration & Minerals Limited | Au Mo | SEE UNDER GAUTHIER TOWNSHIP | | | |
| Lebel | 32D/04 | Jokabo Resources Inc. | Au | Assess | Mag VLF-EM | 1982 | 2.4538 |
| Lebel | 32D/04 | Labine, M.J. | Au | Assess | DD (1) 352' | 1983 | |
| Lebel | 32D/04 | Lampe Resources Co. Ltd. | Au | Assess | DD (2) 883' | 1982 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Lebel | 32D/04 | Marshall, H.J. | Au | Assess | DD (1) 331' | 1983 | |
| Lebel | 32D/04 | North Kirkland Mines, Ltd. | Au | Assess | DD (10) 2417' | 1983 | |
| Lebel | 32D/04 | O'Connor, F.T. | Au | Assess | DD (1) 163' | 1981 | |
| Lebel | 32D/04 | Rio Tinto Canadian Expl. Ltd.<br>"Kaplan Option" | Au U | D | DD (7) 1835' | 1966 | |
| Lebel | 32D/04 | Tower Gold Resources Ltd.<br>"Commodore Group" | Au | Assess | Mag VLF-EM | 1982 | 2.4966 |
| Lee & Maisonville | 42A/01 | Cooper, W. | Au | Assess | rTr | 1982 | |
| Maisonville | 42A/01 | Cooper, W. | Au | SEE UNDER LEE TOWNSHIP | | | |
| Maisonville | 42A/01 | Kruzyeski, A. | Au BM | Assess | SA | 1980 | 2.4195 |
| Maisonville | 42A/01 | Lacana Mining Corp.<br>"Kapakita Group" | Au BM | Assess | Mag | 1981 | 2.4319 |
| Maisonville | 42A/01 | Noranda Exploration Co. Ltd. | Au | Assess | SA | 1983 | 2.5498 |
| Marathon | 42A/15 | Noranda Exploration Co. Ltd.<br>"Moody 1-81 & Baine 1-81" | Au | SEE UNDER [illegible] TOWNSHIP | | | |
| Marathon & Moody | 42A/16 | Utah Mines Limited<br>"Marathon Lake Property" | Au | Assess | DD (2) 2772'<br>Mag HLEM | 1983<br>1983 | <br>2.5533 |
| Marriott & Stoughton | 32D/12 | Canamax Resources Inc.<br>"Dalhousie Oil & Gas Option" | Au BM | Assess | AMag AEM<br>DD (2) 1040' | 1982<br>1983 | 2.5166 |
| Marriott | 32D/12 | Canamax Resources Inc<br>"Marriott-1" | Au | Assess | DD (2) 1132' | 1983 | |
| Marriott | 32D/12 | Canamax Resources Inc<br>"Marriott-2" | Au | Assess | DD (7) 2889' | 1983 | |
| McCool | 42A/09 | Amax Minerals Exploration<br>"McCool-2" | Au | Assess | AEM AMag | 1982 | 2.5098 |
| McCool | 42A/09 | Placer Development Ltd.<br>"Deloro Option" | Au | Assess | DD (9) 5371'<br>GL | 1982<br>1982 | <br>2.5646 |
| McElroy | 32D/04 | Bastarache, G. | Au | Assess | DD (1) 182' GTr | 1982 | |
| McElroy | 32D/04 | Falconbridge Copper Corp.<br>"Bastarache-Castonguay Opt." | Au BM | Assess | HLEM VLF-EM | 1981 | 2.4083 |
| McElroy | 32D/04 | Falconbridge Copper Corp.<br>"Holy Hill Project" | Au Mo | Assess | DD (3) 287' | 1982 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| McElroy | 32D/04 | Falconbridge Copper Corp.<br>"Superior Northwest Opt." | BM | Assess | DD (8) 3886' | 1981 | |
| McElroy | 32D/04 | MacGregor, R.A.<br>"South-East Grid" | Au | Assess | Gc<br>VLF-EM GL | 1982<br>1982 | 2.5221<br>2.4522 |
| McElroy | 32D/04 | Tagliamonte, F.P. | Au | Assess | Mag | 1982 | 2.4914 |
| McFadden | 32D/04 | Canadian Nickel Co., Ltd.<br>"MacGregor Property" | Au | SEE UNDER HEARST TOWNSHIP | | | |
| McFadden | 32D/04 | MacGregor, R.A.<br>"Martin Bird South" | Au | SEE UNDER HEARST TOWNSHIP | | | |
| McFadden | 32D/04 | San Rafael Resources Ltd. | Au | SEE UNDER HEARST TOWNSHIP | | | |
| McGarry | 32D/04 | Canadian Nickel Co., Ltd.<br>"MacGregor Property" | Au | SEE UNDER HEARST TOWNSHIP | | | |
| McGarry | 32D/04 | Kennco Expl. Can. Ltd.<br>"Pelangie-Larder Option" | Au | Assess | DD (1) 2290'<br>Gc | 1981<br>1982 | <br>2.5336 |
| McGarry | 32D/04 | Kerr Addison Mines Ltd.<br>"L. 575322" | Au | Assess | Mag VLF-EM | 1981 | 2.4100 |
| McGarry | 32D/04 | Leahy, M.<br>"Border Group" | Au | Assess | Mag | 1981 | 2.4179 |
| McGarry | 32D/04 | Lee Geo-Indicators Ltd. | Au | Assess | DD (4) 1529'<br>Gc | 1983<br>1981 | <br>2.5012 |
| McGarry | 32D/04 | Maloof, M. | Au | Assess | VLF-EM | 1981 | 2.4050 |
| McGarry | 32D/04 | McGregor, R.A. | Au | Assess | VLF-EM<br>DD (1) 101' | 1982<br>1983 | 2.5307 |
| McGarry | 32D/04 | Noranda Expl. Co. Ltd. | Au BM | Assess | DD (4) 1626' | 1981 | |
| McNeil | 42A/02 | Johns-Manville Canada Inc.<br>"Bobjo Group" | Au | Assess | VEM<br>Mag VEM<br>Mag | 1983<br>1983<br>1982 | 2.5405<br>2.5541<br>2.4608 |
| McNeil | 42A/02 | King, M.& Weekley, L. | Au | Assess | DD (5) 1600'<br>rTr | 1983<br>1982 | |
| McVittie | 32D/04 | Edmor Resources Inc. | Au | Assess | DD (14) 3416' rTr SA GL Mag<br>VLF-EM | 1980 | 2.3794 |
| McVittie | 32D/04 | Lefebvre, A. | Au | Assess | rTr | 1982 | |
| McVittie | 32D/04 | MacGregor, R.A.<br>"Group 2 East" | Au | Assess | GL | 1981 | 2.4525 |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| McVittie | 32D/04 | MacGregor, R.A.<br>"Claim 562060" | Au | Assess | VLF-EM<br>DD (1) 181' | 1981<br>1980 | 2.4483 |
| McVittie | 32D/04 | Queenston Gold Mines Ltd.<br>"McIntosh Property" | Au | Assess | Mag | 1981 | 2.4430 |
| McVittie | 32D/04 | Swansea Gold Mines Inc. | Au | Assess | DD (1) 223' | 1982 | |
| Michaud | 42A/08<br>42A/09 | Falconbridge Nickel Mines Ltd.<br>"Marchaud Option" | Au | Assess | VLF-EM<br>DD (1) 390'<br>SA<br>Mag VLF-EM<br>Mag | 1982<br>1980<br>1983<br>1982<br>1983 | 2.4806<br><br>2.5577<br>2.4807<br>2.5514 |
| Michaud | 42A/08 | Gold Fields Canadian<br>Mining Limited | Au | SEE UNDER GUIBORD TOWNSHIP | | | |
| Michaud | 42A/08 | Nahanni Mines Ltd. | Au | Assess | Mag HLEM | 1981 | 2.4094 |
| Michaud | 42A/08 | Redstone Resources Inc. | Au | Assess | Mag VLF-EM HLEM | 1982 | 2.4526 |
| Midlothian | 41P/14 | Clayton, M. | Au | Assess | VLF-EM | 1981 | 2.4394 |
| Montrose | 41P/15 | Rahn Lake Mines Corp. Ltd. | Au | SEE UNDER BANNOCKBURN TOWNSHIP | | | |
| Moody | 42A/16 | Utah Mines Limited<br>"Jim's Lake Property" | Au | SEE UNDER GALNA TOWNSHIP | | | |
| Moody | 42A/16 | Utah Mines Limited<br>"Marathon Lake Property" | Au | SEE UNDER MARATHON TOWNSHIP | | | |
| Moody | 42A/15 | Noranda Exploration Co. Ltd.<br>"Moody 1-81 & Galna 1-81" | Au | SEE UNDER BOWYER TOWNSHIP | | | |
| Morisette | 32D/04 | Merrick, A. | Au | Assess | DD (2) 317' | 1980 | |
| Morrisette | 32D/04 | Ward, J.T.<br>"Blewett Mountain Group" | Au | Assess | Mag<br>VLF-EM | 1981<br>1982 | 2.4204<br>2.4510 |
| Mortimer | 42A/15 | St. Denis, R. | Au | Assess | rTr SA<br>SA | 1983<br>1982 | 2.4566<br>2.5305 |
| Munro | 42A/09 | Richmond, G. | Au | Assess | STr | 1981 | |
| Northeast Bay | 32D/13<br>42A/16 | Esso Minerals Canada | BM Au | SEE UNDER CHESNEY BAY TOWNSHIP | | | |
| Noseworthy | 32D/05 | Newmont Exploration of<br>Canada Limited | Au<br>BM | Assess | DD (5) 3030' CS | 1980 | |
| Ossian | 32D/04 | Rock Ore Exploration &<br>Development, Limited | Au | SEE UNDER KATRINE TOWNSHIP | | | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Otto | 42A/01 | Argentex Resource Expl. Corp. | Au | Assess | Gc<br>VLF-EM Mag | 1981<br>1981 | 2.4290<br>2.4086 |
| Otto | 42A/01 | Birnie, B. | Au | Assess | rTr<br>STr rTr | 1982<br>1983 | |
| Otto | 42A/01 | Jami Minerals & Expediting Limited "Group C" | Au | Assess | VLF-EM | 1982 | 2.4087 |
| Otto | 42A/01 | Jami Minerals & Expiditing Ltd. "Group D" | Au | Assess | VLF-EM<br>GL<br>HLEM | 1981<br>1982<br>1982 | 2.4302<br>2.5116<br>2.5268 |
| Otto | 42A/01 | Lenora Exploration Limited | Au | SEE UNDER EBY TOWNSHIP | | | |
| Otto | 42A/01 | Reed, J.D. | Au | SEE UNDER EBY TOWNSHIP | | | |
| Otto | 42A/01 | Vesich, Z. | Au | Assess | DD (2) 226′ | 1982 | |
| Pacaud | 31M/13 | Gilson, R. | Au | Assess | STr rTr | 1983 | |
| Pacaud | 41P/16 | Hurd, D.F. | Au | Assess | rTr | 1982 | |
| Pacaud | 31M/13 | Paiement, J.R. | Au | Assess | Mag | 1982 | 2.5182 |
| Pacaud | 31M/13 | Tagliamonte, F.P. | Au | Assess | Mag | 1982 | 2.4832 |
| Pontiac | 32D/05 | Falconbridge Nickel Mines Limited | Au | Assess | VLF-EM Mag | 1981 | 2.4059 |
| Powell | 42A/15 | Fox, P. | Au | Assess | rTr | 1983 | |
| Purvis | 32D/13<br>42A/16 | Esso Miner-ls Canada | BM Au | SEE UNDER CHESNEY BAY TOWNSHIP | | | |
| Purvis | 42A/16 | Esso Minerals Canada "Halfway Lake Project" | Au | Assess | AEM | 1982 | 2.5344 |
| Purvis | 42A/16 | Noranda Exploration Co. Ltd. "Bowyer 2-82" | BM Au | SEE UNDER BOWYER TOWNSHIP | | | |
| Rand | 32D/12 | Parquet Resources Inc. | Au Cu | Assess | Mag VLF-EM | 1981 | 2.4415 |
| Rattray | 32D/04 | MacGregor, R.A. "Rattray Group" | Au | Assess | GL | 1982 | 2.5055 |
| Semple | 41P/14<br>42A/03 | Amax Minerals Exploration "English-2" | Au | SEE UNDER ENGLISH TOWNSHIP | | | |
| Skead | 31M/13 | Canadian Nickel Co. Ltd. | Au | SEE UNDER HEARST TOWNSHIP | | | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Shead | 31M/13 | Noranda Exploration Co. Ltd.<br>"MacGregor Option" | Au | Assess | DH (2) 581' | | |
| Shead | 32D/04<br>31M/13 | MacGregor, R.A.<br>"Grace Lake Baseline" | Au | SEE UNDER HEARST TOWNSHIP | | | |
| Shead | 31M/13 | Superior Northwest Inc. | Au | Assess | VLF-EM | 1982 | 2.4493 |
| St. Laurent | 32E/05 | Newmont Exploration of Canada, Limited<br>"Patten River Group" | Au BM | SEE UNDER HURTUBISE TOWNSHIP | | | |
| Stoughton | 32D/12 | Canamax Resources Inc.<br>"Dalhousie Oil & Gas Option" | Au | SEE UNDER MARRIOTT TOWNSHIP | | | |
| Stoughton | 32D/12 | Noranda Exploration Co. Ltd. | Au | Assess | DD (1) 863' | 1981 | |
| Stull | 41P/06 | Patino Mines (Quebec) Ltd. | Au | SEE UNDER BROWNING TOWNSHIP | | | |
| Sulphur Island | 32D/13<br>42A/16 | Esso Minerals Canada | BM Au | SEE UNDER CHESNEY BAY TOWNSHIP | | | |
| Sulphur Island | 32D/13 | Gold Island Resources Ltd. | Au | Assess | Mag VLF-EM | 1983 | 2.5504 |
| Tannahill | 32D/05 | Canamax Resources Inc.<br>"Bastarache-Mathias Option" | Au | SEE UNDER HOLLOWAY TOWNSHIP | | | |
| Tannahill | 32D/05 | Mathias, A. | Au | Assess | STr | 1983 | |
| Taylor | 42A/10 | Hollinger Argus Ltd.<br>"Group 3C & 5E" | Au | Assess | Mag VLF-EM | 1982 | 2.4880 |
| Teck | 42A/01 | Argentex Resources Expl. Inc. | Au | Assess | Mag VLF-EM | 1982 | 2.4707 |
| Teck | 42A/01 | Eden Roc. Mineral Corp. | Au | Assess | DD (1) 936' | 1982 | |
| Teck | 42A/01 | Harrington, P.J. | Au | Assess | DD (2) 540' | 1982 | |
| Teck | 42A/01 | Jami Minerals & Expediting<br>"Dymont-Kidston Group A" | Au | Assess | VLF-EM<br>VLF-EM | 1981<br>1981 | 2.4269<br>2.4182 |
| Teck | 42A/01 | Labrador Expl. Ont. Ltd.<br>"Dymont-Kidston "A&B" Project" | Au | Assess | GL<br>Mag HLEM<br>Mag HLEM<br>DD (6) 2245'<br>GL | 1982<br>1982<br>1982<br>1982<br>1982 | 2.5152<br>2.4917<br>2.4918<br><br>2.5153 |
| Teck | 42A/01 | Leahy, M. | Au | Assess | STr, SA | 1982 | |
| Teck | 42A/01 | Perron, A.N. | Au | Assess | Mag VLF-EM | 1982 | 2.4550 |
| Teck | 42A/01 | Stewart, A.K. | Au | Assess | DD (2) 401' | 1982 | |

**TABLE 4 Continued**

| LOCATION | NTS | FILE NAME | COMMODITY SOUGHT | TYPE OF REPORT | TYPE OF WORK PERFORMED | DATE OF WORK | TORONTO FILE NO. |
|---|---|---|---|---|---|---|---|
| Teefy | 42A/10 | Amax Minerals Exploration<br>"Teefy-1" | Au BM | Assess | GL<br>DD (4) 2204' | 1981<br>1982 | 2.4768 |
| Teefy | 42A/10 | Amax Minerals Exploration<br>"Teefy-2" | Au BM | Assess | GL<br>DD (4) 2149' | 1981<br>1982 | 2.4767 |
| Teefy | 42A/10<br>42A/15 | Canamax Resources Inc. | Au | SEE UNDER EDWARDS TOWNSHIP | | | |
| Truax | 41P/16 | Attwater, D. | Au | Assess | STr | 1982 | |
| Tweed | 42A/08 | Utah Mines Limited | BM | SEE UNDER BLAKELOCK TOWNSHIP | | | |
| Unwin | 41P/16 | Patino Mines (Quebec) Ltd. | Au | SEE UNDER BRADBURN TOWNSHIP | | | |
| Walker | 42A/10 | Amax Minerals Exploration<br>"Walker-1" | Au BM | Assess<br>D | GL<br>DD (1) 374' | 1981<br>1982 | 2.4771 |
| Walker | 42A/10 | Amax Minerals Exploration<br>"Walker-2" | Au BM | Assess | GL | 1981 | 2.4770 |
| Walker | 42A/10 | Falconbridge Nickel Mines Ltd.<br>"T. Bell Property" | Au | Assess | HLEM | 1982 | 2.4452 |
| Walker | 42A/10 | Golden Grail Mineral Expl. Co. | Au | Asses | Mag | 1982 | 2.5128 |
| Warden | 42A/09 | Canamax Resources Inc. | Au | SEE UNDER COULSON TOWNSHIP | | | |
| Warden | 42A/16<br>42A/09 | Dome Exploration Can. Ltd.<br>"Camp Creek Option" | Au | SEE UNDER KERRS TOWNSHIP | | | |
| Wesley | 42A/16 | Noranda Expl. Co. Ltd. | Au | Assess | Mag HLEM | 1983 | 2.5512 |
| Wilkie | 42A/09 | McChristie, N. | Au | Assess | DD (1) 130' | 1982 | |
| Wilkie | 42A/09 | Pyke, D.R. | Au | SEE UNDER CARR TOWNSHIP | | | |
| Zavitz | 42A/08 | Falconbridge Nickel Mines Ltd.<br>"Nechon Option" | Au BM | Assess | VLF-EM<br>GA | 1982<br>1982 | 2.4883<br>2.4882 |

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# Report of Activities 1983
# Cobalt Resident Geologist Area, Northeastern Region

**Leo Owsiacki**[1]

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## Introduction

The effects of a recession lingered into 1983 as recovery in the mining industry lagged behind the general rebound in the economy. The Sherman Iron Mine was shut down for a 14-week period for the second consecutive year and Teck Corporation's Silverfields Mine and mill were permanently closed in June.

Exploration for silver was much more successful in 1983 than in previous years. Agnico-Eagle Mines Limited discovered a significant new ore structure at their Langis Mine; Silverside Resources Incorporated intersected a new silver vein structure in Lorrain Township; Silver Century Explorations Limited discovered new cobalt-silver veins at their King Edward Mine; and Manridge Explorations Limited and Silver Lake Resources Incorporated encountered promising silver-bearing veins near Elk Lake and Gowganda. Exploration for gold in the Temagami "greenstone belt" increased despite the presence of a "Caution" filed as part of an Indian land claim. This caution continues to effectively curtail exploration in much of the area.

Research and mapping projects were initiated during the past several years to augment the geological data-base of the Cobalt area, and ultimately aid exploration. Numerous theses are currently underway in addition to projects being undertaken by the Ontario Geological Survey; the Resident Geologist's Office; and Universities, through the Ontario Geoscience Research Grant Program.

## Resident Geologist's Activities

During the year, the Cobalt Office was staffed by Leo Owsiacki, Resident Geologist, and part-time personnel including P. Anderson, Resource Geologist; R. Clarke, junior assistant; W. Cawley, Experience '83 student, and K. Larabie, secretary.

In July, a building adjacent to the Resident Geologist's Office was leased for the purpose of sample and core storage. Collection of core from drillholes deemed critical was initiated, and hundreds of ore and rock samples, previously collected by R. Thomson and stored in Kirkland Lake, were transferred to Cobalt.

Compilation of Geological Data Inventory Folios was started in June, 1983. To date, 7 have been published, 11 are in press, and 9 in preparation.

A regional structural and stratigraphic study of Early Precambrian volcanic rocks was initiated by the Resident Geologist in an area extending from New Liskeard to Temagami. The first stage of this study involves detailed mapping of previously unmapped or under-mapped small, volcanic inliers. One such inlier is exposed in Banting Township. Both mapping and sampling for gold, silver, and base metals was partially completed during the summer (Owsiacki 1983). A second project is currently nearing completion (Andrews *et al.* 1983). A joint research effort, including geochronology, stable isotope, fluid inclusion, paleomagnetic, and petrographic studies will attempt to determine, if possible, whether the application of these techniques can resolve area problems dealing with origin of vein fluids, time of emplacement, composition of these fluids, and effects over time on the vein minerals.

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[1] Resident Geologist, Ontario Ministry of Natural Resources, Cobalt.

Technical assistance was provided to prospectors, geologists, consulting firms, mining engineers, local municipalities, and mining companies. Consultative services were made available to the general public, government, and private industry. Direction and assistance in accessing Northern Ontario Rural Development (NORDA) grants and other incentive programs, made available to the public through various government agencies, was also provided to companies and individuals.

Numerous companies, new to this area, were attracted here through interest generated by previous work from this office. Representatives for many of these companies were shown new mineral occurrences discovered in the past few years. In addition, many visits were made to mines and prospects in the area, numerous field trips were run for interested parties, and a number of motion picture productions were encouraged to use Cobalt for set locations. Use of the office and facilities increased for the third consecutive year.

A new field guide, "Geology, Silver, and Gold; Cobalt and Kirkland Lake", is nearing completion and will be released during a field trip held in conjunction with the 1984 Geological Association of Canada-Mineralogical Association of Canada General Meeting in London, Ontario, May 14-16, 1984.

In the past several years, efforts have been made to attract interest and funding for University thesis projects. Partly as a result of these efforts, 8 theses are currently underway, with the majority of funding being provided by the Ontario Geoscience Research Grant Program. Assistance was given to many of the students during their field work.

## Mining Activity

Recovery in the mining industry has been slow to follow the progress made in other sectors of the economy in 1983. In this area, as previously mentioned, the Sherman Iron Mine was shut down for a 14-week period. The Silverfield's Mine, a stable producer in the Cobalt area for 19 years, permanently closed in mid-year because of exhaustion of ore reserves. This mine supplied over 50% of the silver production from the Cobalt camp over the past several years.

All 3 area mills operated for varying periods during the year. Teck Corporation's Consolidated Summit Mill processed ore from January to June, and the Sulpetro Minerals Limited mill was re-activated in June for a 6-month period. The Penn Mill of Agnico-Eagle Mines Limited started up in May and operated continuously to year-end.

Agnico-Eagle Mines Limited further expanded their committment to this area during the year. The company now owns 3 producing silver mines (Beaver/Temiskaming, Langis, and Castle) and recently gained control of exploration at Silver Century Explorations' King Edward Mine, where massive cobalt vein structures were encountered earlier this year. With both a local mill and refinery included in their holdings, and control of a large acreage including many of the principle past producers of this area, the company is in a firm position to take advantage of any future upward movements in the price of silver. A 50% projected increase in silver production this year (Northern Miner, June 30, 1983) should see Agnico-Eagle Mines Limited taking up much of the slack created by the closure of the Silverfields Mine.

In addition to these developments, Sulpetro Minerals Limited has resumed silver mining operations, Silver Lake Resources has outlined a potential new silver mine in the Elk Lake area, and a number of junior exploration companies have intersected high grade silver-bearing structures in Cobalt and Gowganda.

The Agnico-Eagle Mines Limited Refinery operated continuously during the year with the majority of feed coming from Agnico-Eagle Mines Limited's local mines. Refining of Sulpetro Minerals Limited's milled tailings material was also undertaken. The Cobalt Refinery operated intermittently, processing photographic film and residue for lead and silver. The refinery site is owned jointly by Tremus and TEMREX. A part of this site has been rented to Carol Minor Metals Limited, a new, local company which is currently, with the aid of various government grants, experimenting with roasting of arsenical concentrates from various mines. It is hoped that a small pilot roaster can be built in 1984 and expanded in the future to recover a variety of metals currently lost in other refining processes.

Mineral commodities mined and paid for in 1983 included silver (approximately 1 094 919 ounces), iron ore pellets (762 040 tonnes), copper (12 850 kg), limestone (5963 tonnes), decorative building stone, quartz, and sand and gravel. In addition, substantial quantities of cobalt and nickel were mined along with silver but not paid for.

## Silverfields Mine (Teck Corporation Limited)

This highly profitable silver mine permanently ceased operations in June of this year because of exhaustion of ore

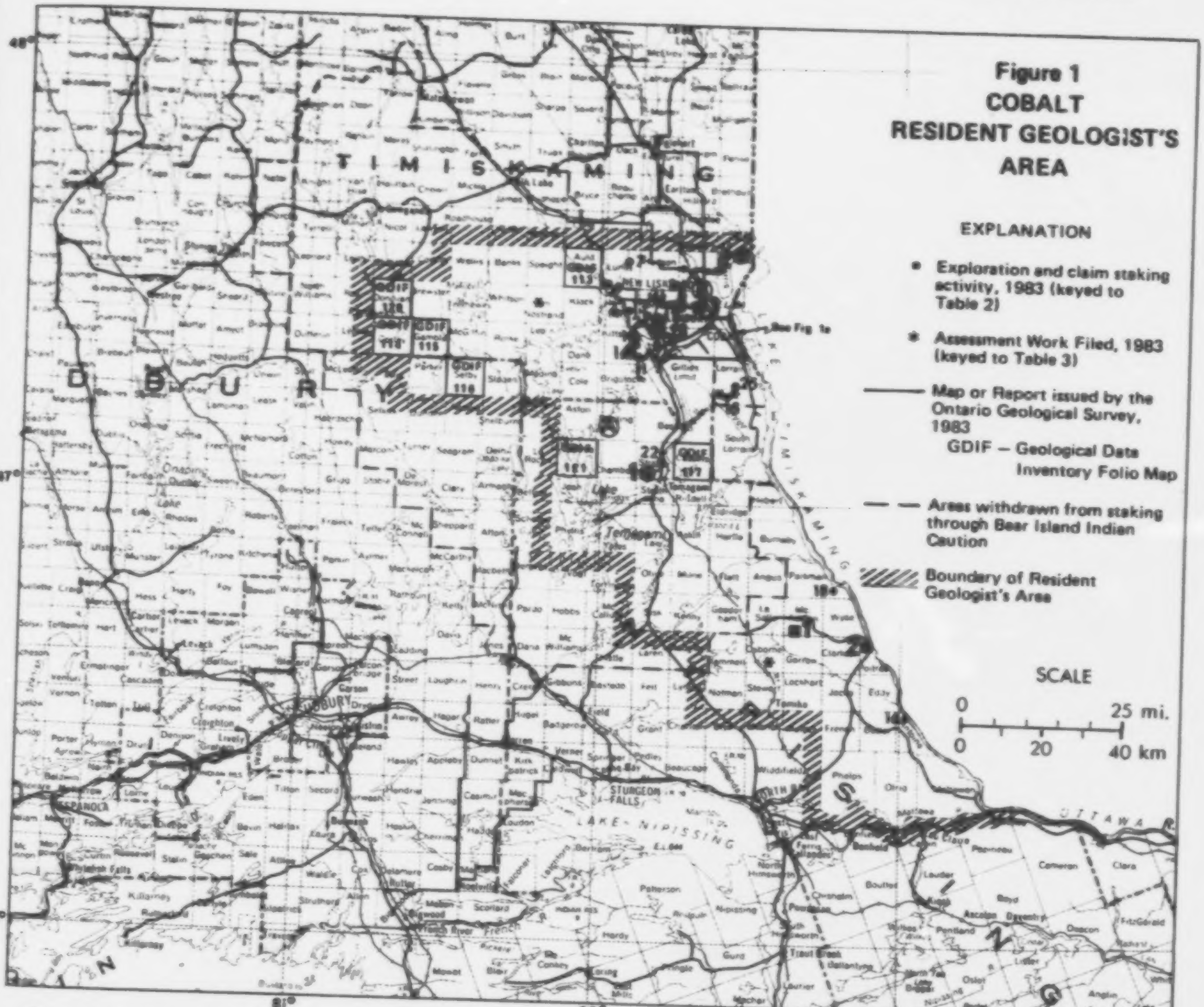

**Figure 1**
**COBALT**
**RESIDENT GEOLOGIST'S**
**AREA**

EXPLANATION
• Exploration and claim staking activity, 1983 (keyed to Table 2)
* Assessment Work Filed, 1983 (keyed to Table 3)
Map or Report issued by the Ontario Geological Survey, 1983
GDIF – Geological Data Inventory Folio Map
Areas withdrawn from staking through Bear Island Indian Caution
Boundary of Resident Geologist's Area
SCALE
0
25 mi.
0
20
40 km
TIMISKAMING
SUDBURY
NIPISSING
SUDBURY
STURGEON FALLS
LAKE NIPISSING
OTTAWA R.
48°
47°
46°
81°
80°
79°
See Fig. 1a
GDIF 118
GDIF 115
GDIF 116
GDIF 113
GDIF 111
GDIF 117

● Producing Mines, 1983
1. Sherman Mine (Dofasco, Tetapaga Mining Co. Ltd.) . . . Fe
2. Langis Mine (Agnico-Eagle Mines Ltd.). . . . . . . . . . . Ag
3. Beaver-Temiskaming Mine (Agnico-Eagle Mines Ltd. . . . . . . . . . . . . . . . . . . . . . . . . . . Ag
4. Canadaka Tailings (Sulpetro Minerals Ltd.) . . . . . . . . Ag

◑ Mines Under Development, 1983
1. King Edward Mine (Silver Century Exploration Ltd. and Agnico-Eagle Mines Ltd.) . . . . . . . . . . . . . . . . Ag

⊗ Mines Producing in 1983 and Subsequently Closed
1. Silverfields Mine (Teck Corporation) . . . . . . . . . Ag, Au

⊕ Mines Currently Maintained on Stand-by Basis
1. Conisil (Sulpetro Minerals Ltd.). . . . . . . . . . . . . . Ag
2. Lawson (Sulpetro Minerals Ltd.) . . . . . . . . . . . . . Ag
3. Cleopatra (Sulpetro Minerals Ltd.) . . . . . . . . . . . . Ag

■ Producing Quarries
1. McLaren's Bay Mica Stone Quarries . . . Stone
2. Thorne Brilliant Stone Quarry. . . . . . . Stone
3. Dymond Clay Products Ltd.. . . . . . Limestone

Operating Refineries
1. Agnico-Eagle Refinery
2. Cobalt Refinery Ltd.

① Operating Mills
1. Teck Corp.-Con. Summit Mill
2. Agnico-Eagle Mines Ltd. Penn Mill
3. Sulpetro Mill

Ⓐ Location of Resident Geologist's Field Mapping, 1983

Ⓑ Location of OGS Field Party, 1983

## Cobalt Area

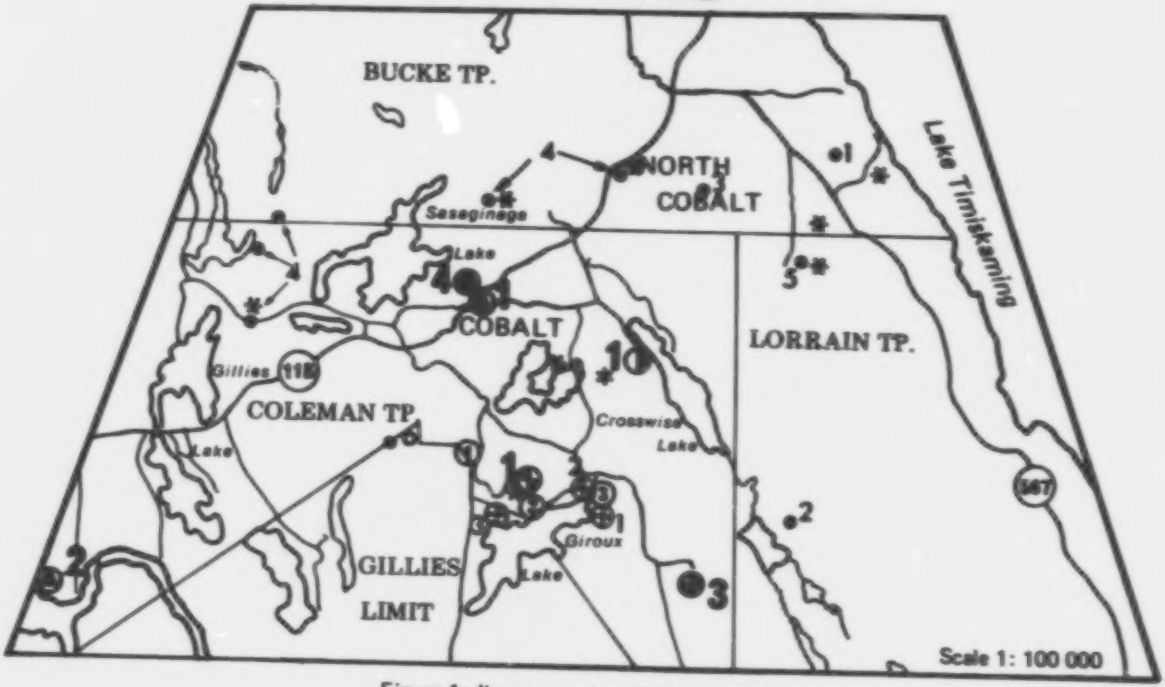
BUCKE TP.
NORTH COBALT
Saseginaga
Lake
COBALT
Lake Timiskaming
LORRAIN TP.
Gillies
11B
COLEMAN TP.
Crosswise
Lake
Lake
Giroux
Lake
GILLIES
LIMIT
567
Scale 1: 100 000

Figure 1a (base map after OGS map 5024)

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

OFR 5386
OFR 5439
OFR 5440
OFR 5447
OFR 5476

Preliminary Maps - Geological Series

Preliminary Maps - Data Series

GDIF 113
GDIF 114
GDIF 115
GDIF 116
GDIF 117
GDIF 120
GDIF 121

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports

MP 77
MP 107
MP 113
MP 116

Geological Survey of Canada Open File Reports

OFR 948
OFR 949
OFR 950

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | McCullough, E.W. | Claim staking (1), Bucke Township |
| 2 | Brown, T.D. | Claim staking (5), Lorrain Township |
| 3 | Gore, J.A. | Claim staking (1), Bucke Township |
| 4 | Highland Crow Resources/Copperfields Mining Corporation | Surface diamond drilling, Lorrain Township |
| 5 | Silverside Resources Ltd. | Surface diamond drilling, Lorrain Township |
| 6 | Wabigoon Resources | Reconnaissance geology, Coleman Township and Gillies Limit |
| 7 | Morgan, T.A. | Claim staking (5), Lundy Township |
| 8 | Armstrong, W.A.J. | Claim staking (10), Coleman and Firstbrook Townships |
| 9 | Ferguson, B.H. | Claim staking (6), sampling, prospecting, Lundy Township |
| 10 | Gore, J.A. | Claim staking (2), Coleman Township |
| 11 | Taylor, W.R. | Claim staking (1), Coleman Township |
| 12 | The Hudson Bay Mines Ltd. | Claim staking (28), Firstbrook Township |
| 13 | Byberg, A. | Claim staking (8), Firstbrook Township |
| 14 | Parcher, A.C. | Claim staking (13), Coleman Township |
| 15 | Clarke, A.G. | Claim staking (2), prospecting, Lorrain Township |
| 16 | Blais, R.M. | Claim staking (2), Antoine Township |
| 17 | Parcher, A.C. | Claim staking (17), Coleman Township |
| 18 | Mortimer, C.H. | Claim staking (6), Parkman Township |
| 19 | Evans, D. | Claim staking (1), Bucke Township |
| 20 | The Hudson Bay Mines Ltd. | Claim staking (2), Coleman Township |
| 21 | The Hudson Bay Mines Ltd. (R. Benner claims) | Surface diamond drilling, geophysical survey, Firstbrook Township |
| 22 | ? | Surface diamond drilling, Strathy Township |
| 23 | Sirola, D. | Prospecting, geophysical survey, Barr Township |
| 24 | Monopros | Airborne electromagnetic and magnetic surveys, Bucke Township |
| 25 | Quinlan & Associates Holdings Ltd. "Gemrec" | Quarrying, Lorrain Township |

TABLE 3

## ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

### SUDBURY MINING DIVISION

### SYMBOLS AND ABBREVIATIONS

AEM-Airborne Electromagnetic Survey
Ag-Silver
A Mag-Airborne Magnetometer Survey
Assess-Assessment Work
Au-Gold
BM-Base Metal
Co-Cobalt

D-Donated by Company or Individual
DD-Diamond Drilling (where shown, the numbers following "DD" indicate the number of holes drilled and the total length drilled respectively).
Geochem-Geochemical Survey
GL-Geological Survey

Non Assess-Non Assessment Work Data
OMEP-Ontario Mineral Exploration Program
SA-Sampling, Assays
STr-Stripping
rTr-Rock Trenching
UG-Underground Work
VLF-Very Low Frequency

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Bucke Twp. | 31M/5 | Highland Crow Resources | Ag, BM | Assess | DD 1-645, GL, Geochem | 1982 | 5.605261 | |
| Bucke Twp. | 31M/5 | Highland Crow Resources | Ag, BM | Assess | DD 1-651 | 1983 | 5.607483 | |
| Bucke Twp. | 31M/5 | Teledyne Canada Ltd. | Co, Ag | OMEP | DD 6-4203,<br>DD 22-6168,<br>SA, UG | 1979 | 63.3927 | |
| Bucke Twp. | 31M/5 | Monopros Ltd. | ? | Assess | AEM, A Mag | 1982 | 5.667558 | |
| Bucke Twp. | 31M/5 | Silverside Resources Ltd. | Ag | D | DD 3-1296 | 1982 | | |
| Coleman Twp. | 31M/5 | Highland Crow Resources | Ag, BM | Assess | DD 1-308 | 1982 | 5.607422 | |
| Coleman Twp. | 31M/5 | Silver Century Exploration Ltd. | Ag | OMEP | UG, Non Assess | 1980 | 63.3751 | |
| Coleman Twp. | 31M/5 | Silverfields Mine | Ag | D | UG | 1983 | | |
| Firstbrook Twp. | 31M/5 | Benner, R. | Ag | Assess | VLF | 1982 | 2-5279 | |
| Firstbrook Twp. | 31M/5 | Conwest Exploration Co. Ltd. | BM, Ag, Au | D | DD 1-403, SA | 1978 | | |
| Lorrain Twp. | 31M/5 | Silverside Resources Ltd. | Ag | D | DD 9-4331 | 1983 | | |
| Lorrain Twp. | 31M/5 | Latour Lake Property | Ag | Assess | VLF | 1981 | 2.4460 | |
| Lorrain Twp. | 31M/5 | Latour Lake Property | Ag | Assess | VLF | 1982 | 2.4912 | |
| Osborne Twp. | 31L/11 | Vaillancourt, G. | ? | Assess | STr, rTr | 1982 | 5.608384 | |
| Van Nostrand Twp. | 41P/8 | Mortimer, C.H. | Ag | Assess | rTr | 1982 | 5.502118 | |

reserves on the property. The Consolidated Summit Mill, operated by Teck Corporation Limited, also closed at this time. During the 19-year life span of the mine, 20 million ounces of silver were produced. Much of the equipment at the mine site is being removed and transferred to other properties controlled by Teck.

## Sulpetro Minerals Limited

Mining of tailings, located immediately north of the Town of Cobalt, started in June and continued for a 6-month period. Remaining reserves are estimated at 150 000 tonnes averaging 3.5 ounces silver per tonne over an average depth of 1.5 m. If current silver prices remain stable or improve, the operation will continue on a seasonal basis. In 1983, 35 393 tonnes of tailings were processed at the local Canadaka mill (wholly owned by Sulpetro Minerals Limited) to produce 77 458 ounces of silver.

Underground workings at the Cleopatra, Lawson, and Conisil Properties are being pumped and facilities maintained. The old headframe at the University shaft was accidently burned down in May and resulted in flooding of the workings. A new headframe may be built to facilitate future exploration and/or mining.

## Sherman Mine (Dofasco Incorporated and Tetapaga Mining Company Limited)

A continuing lack of demand for steel products forced a second consecutive summer closure of the mine and plant. As a result, production declined 12% from the previous year to 762 040 tonnes of pellets produced from 2.79 million tonnes of crude ore. Waste rock removed totaled 4.17 million tonnes. This represents a 45% reduction in mining from normal production levels reached prior to 1982.

During 1983, ore in the South Pit was found to be pinching out with depth. Mining from this area will subsequently cease at the end of 1983. Widening and deepening of the West Pit continued during the year, and stripping and mining of the first bench at the East Pit was initiated. In 1983, 47% of the crude ore was mined from the East Pit, 33% from the West Pit, and 20% from the South Pit.

## Langis Mine (Agnico-Eagle Mines Limited)

Extensive underground exploration drilling continued during the year in conjunction with mining and development activities. The mine began producing in January for the first time since closure in 1968. Current mining is restricted to a single stope, accessible from the 5th level. Silver occurs here within a shoot restricted to the parts of the vein cutting the Coleman Member (thinly laminated argillite) lying immediately above an unconformity with Early Precambrian mafic volcanic rocks. The bulk of the ore occurs as native silver in a variety of forms, and as argentite coating fractures.

Recent exploration has outlined 2 new potential stopes in the vicinity of the old #6 shaft working. One zone includes a relatively minor structure paralleling a previously mined vein, whereas the other appears to be a completely new "orebody".

The #6 shaft headframe was torn down during the year and the workings were dewatered from an access crosscut via the #3 shaft, 700 m to the west.

## Beaver-Temiskaming Mine (Agnico-Eagle Mines Limited)

Continuous silver mining, exploration, and development was carried out in 1983 on 4 principle vein structures (#37, #38, #41, and #44). A new level, established at a depth of 1330 feet was completed, and drilling above this level has indicated that high grade ore continues upward along these veins.

The #38 and #41 veins are parallel, dilatant, east-trending structures and join the parallel, north-trending shear veins, #37 and #44, to produce a rhombic shape. These veins cut Early Precambrian volcanic flows and interflow sediments beneath the lower contact of a Nipissing diabase sill. The sill here has followed an Archean fault, producing a large step in the contact. The ore shoots are concentrated under this structure and appear to dissipate upon entering the diabase.

# Exploration Activity

Exploration activity once again focused on the search for silver. However, an increasing interest in gold in the Temagami "greenstone belt", and kimberlites in the Temiskaming rift valley (Lovell and Caine 1970) has been noted.

Surface diamond drilling activity decreased from the prior 2 years but an increase in underground exploration drilling resulted in fairly stable drilling activity (Figure 2). Claim staking activity remained relatively static compared to previous years. Major exploration undertaken during 1983 is summarized below.

Silverside Resources Incorporated continued a surface diamond drilling program in Lorrain Township. Thirteen holes were drilled in the last quarter of this year near a minor silver occurrence drilled last year, about 700 m south of the formerly producing Pan Silver Mine. Other former nearby producers include the Agaunico, Green-Meehan, and Cobalt Contact Properties. The zone of interest lies below an extensive cover of clay and boulder till which can reach thicknesses of 25 to 35 m. Below the overburden, a thin wedge of a Nipissing diabase sill dips gently south and east. Coleman Member conglomerates and argillites are preserved below the diabase contact and rest unconformably on Early Precambrian mafic flows. In this particular area, a northeast-trending quartz-feldspar prophyry dike intrudes the flows within the Early Precambrian basement. A well-developed vein system parallels the south contact of this dike, and ore intersections have been encountered over a length of 50 m in Coleman Member sediments, above this contact and below the Nipissing diabase.

Highland-Crow Resources Limited and Copperfields Mining Corporation jointly (50/50) diamond drilled 8 holes on a 75-claim group in Coleman and Bucke Townships in early 1983. Anomalies outlined by geophysical and geochemical surveys undertaken in 1982 were tested. The holes penetrated thick sequences of Gowganda Formation sedimentary rocks and were spotted to locate silver vein-type mineralization and to determine depth to basement, basement rock types, and potential for non-vein (sedimentary-type) mineralization in the Huronian.

The Hudson Bay Mines Limited company was recently reactivated and listed on the Toronto Stock Exchange. Part of the funds raised from the share issue are being applied towards a drill program currently in progress on ground optioned from geologist R. Benner in Firstbrook Township. The area has received intermittent attention over the past few decades because of the presence of an Archean-age rhyolitic inlier protruding through Gowganda sediments, intruded by Nipissing diabase. Minor silver and cobalt occurrences were previously found in the diabase, and sulphide mineralization in the rhyolitic rocks. Exploration has alternated between that for stratiform base-metal deposits and silver vein-type occurrences. During the past several years, R. Benner has conducted VLF surveys over the Gowganda Formation sediments exposed around the inlier. The results of this work outlined conductors believed to represent buried Archean interflow sediments and related faults. The drill program was set-up to establish; (a) the depth to basement, (b) the presence of interflow sediments, which could represent extensions of similar rocks in Cobalt, and (c) the presence of silver-arsenide veins associated with these rocks and accompanying structures. Drilling to date has confirmed the presence of a thick band of interflow sediments, comprised of graphitic cherts, silts, and wackes, and parallel fault structures beneath Archie Lake. No significant veins have yet been intersected.

Prospectors Airways 1981 hold patented claims in Strathy Township. During 1983, linecutting and geophysical surveys were undertaken. A number of holes were subsequently drilled on the possible south extension of the Penrose massive arsenopyrite vein. In the past, this vein was explored underground to the north and found to carry significant gold and base-metal values.

Silver Century Explorations Limited concluded a long exploration cross-cut, started in 1982, at the underground workings of their King Edward Mine. The cross-cut is completely within Archean mafic volanic rocks and immediately below a Nipissing diabase sill. Six to 8 good calcite vein structures were exposed along its length. Two new massive cobalt veins were intersected at the end of the cross-cut and a few good silver values encountered from limited diamond drilling at this location. The veins occur beneath structures mined in the past from an Archean cap exposed on the top of the Nipissing sill (Nova Scotia Mine). In May, Agnico-Eagle Mines Limited agreed to spend $1.5 million in exploration and development of the property in return for 50% ownership and control of exploration. In addition, certain properties owned by Agnico-Eagle Mines Limited and adjoining those of Silver Century Explorations Limited would be contributed to the exploration/development program. Subsequent to this deal, Agnico-Eagle Mines Limited conducted an extensive underground diamond-drill program in the vicinity of the new veins.

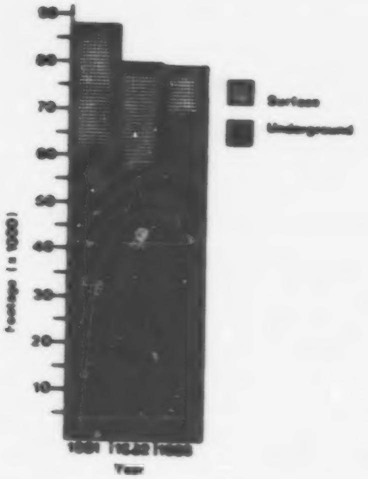

Figure 2 — Exploration Diamond Drilling Activity in the Cobalt Resident Geologist's Area.

Prospecting activity showed a marked increase during the year. Up to 40 individuals actively searched for silver and gold in various parts of the camp. In addition, an increasing awareness and interest in the area was expressed by many companies including Stroud Resources, which recently purchased an option on a gold property near Temagami; COMINCO Limited; St. Joe's Canada Incorporated; Golden Shield Resources Limited; the Atlas Group of Mines; NOREX Resources Limited; Noranda Mines Limited; Monopros; Royal Gold and Silver; A.C. Perron; Quinlan; TEMREX; and Wabigoon Resources which recently purchased a silver property near Cobalt.

Engineering and consulting firms including Minetek, H.G. Engineering, Hannah Associates, and Golden Associates actively pursued projects related to tailings leaching, biological extraction of metals from tailings, and market surveys for limestone.

A more complete summary of exploration activity in the Cobalt Resident Geologist's District in 1983 is provided in Table 2 and Figures 1 and 1a. Data submitted for assessment purposes are summarized in Table 3 and recent Ontario Geological Survey publications are listed in Table 1.

## Industrial Minerals

Dymond Clay Products Limited completed preliminary reserve calculations at their limestone quarry site in Bucke Township. Reserves of 224 331 tonnes limestone, grading 48.6% CaO to a depth of 6 m were outlined in a 400 by 400 foot area. These reserve figures do not, however, adequately reflect important geological controls on the grades. Two 5-metre thick, relatively high grade beds (50 to 53% CaO) of limestone are divided by a lower grade zone. If selectively quarried, an improved grade could easily be obtained. Overburden is relatively shallow (0 to 3 m) and indications are that the beds continue over a large area with similar values. H.G. Engineering has been contracted to produce a market study investigating current and potential uses for the various grades of limestone. Contract negotiations are continuing with area smelters for supply of metallurgical grade material.

Production of both agricultural limestone and metallurgical limestone decreased to 480 tonnes and 98 tonnes respectively this year, while limestone used for fill accounted for 5385 tonnes.

Quarrying of decorative building stone continued for part of the year in Poitras and McAuslan Townships at a reduced scale. Production is usually quite cyclical and is dependant on a strong economy and building industry.

Minor quarrying was undertaken in Lorrain Township for quartz from a relatively clean vein cutting Algoman-age granite.

## Ontario Geological Survey Activities

### Engineering and Terrain Geology Section

Russell completed remapping of a Paleozoic outlier in the Lake Timiskaming area (Russell 1981). Drillhole LT-1, put down in 1963 through a thick succession of Paleozoic rocks off Dawson Point (Thomson 1965) was found and relogged. A detailed sedimentological study of all information has resulted in changes to the positions of contacts and a redefinition of the Silurian stratigraphy (Russell 1983).

A peatland inventory project was recently initiated in the New Liskeard area. Seven detailed sites and 11 reconnaissance sites, comprising 13 200 ha (Riley 1983) are being studied in an effort to evaluate their resource potential.

### Geophysics/Geochemistry Section

Fortescue (1983) initiated a study to investigate acidity of lakes. Bottom sediment samples were collected from lakes north of Lake Wanapitei for environmental and resource appraisal purposes.

### Mineral Deposits Section

Owsiacki (1983) started detailed mapping of Archean volcanic inliers exposed between Cobalt and the Temagami "greenstone belt". The mapping is part of a larger project investigating the regional stratigraphy and structure of basement rocks in this area.

## Research by Other Organizations

### McMaster University

Detailed mapping of a felsic volcanic horizon by T. Hurley was completed during the summer. The map area is located immediately north of the West and North pits at the Sherman Iron Mine near Temagami.

A. Fyon has initiated studies including lithological and alteration mapping in southeastern Strathy Township, and investigations of stratigraphic settings of known mineral occurrences in the Temagami area.

A third study, started last year by N. Blum and R. Bowins (Crocket *et al.* 1983) is nearing completion. Possible links between the iron formation and precious metal mineralization at the Sherman and Adams Mines are being investigated.

### Carleton University

M. Goodz is completing work comparing isotopic compositions of sulphides in silver/arsenide veins at the Beaver-Temiskaming Mine to similar sulphides in adjacent volcanic flows and sediments.

B. Wilson began a project investigating vein-related sulphides and their relationship to sulphides occurring in Huronian sediments.

P. Mustard is studying the complex stratigraphy which makes up the Coleman Member of the Gowganda Formation.

R. Scammell is conducting detailed mapping of a small area in conjunction with P. Mustard's work. Particular emphasis is being placed on features associated with the Huronian/Archean unconformity.

R. Rainbird started a regional study of the transition zone of sediments defining the change from the Gowganda to Lorrain Formations.

## Recent Publications and References

Andrews, A.J., Kerrich, R., Strong, D.F., and Owsiacki, L.
1983 Petrographic and Geochemical Studies of Alteration and Mineralization of the Ag-Co-Ni Arsenide Vein Deposits of Cobalt and Gowganda (Abstract), *in* Geoscience Research Seminar, December 6-7, 1983, Abstracts, Ontario Geological Survey, 22p.

Crocket, J.H., McNutt, R.H., Schwarcz, H.P., Rees, C.E., Blum, N., Hurley, T., Bowins, R., and Kabir, A.
1983 Isotopic and Geochemical Characterization of Archean Iron Formations and Associated Volcanic Rocks—Some Preliminary Results from the Temagami and Boston Iron Formations; Grant 132, p.29-40 *in* Geoscience Research Grant Program, Summary of Research, 1982-1983, edited by E.G. Pye, Ontario Geological Survey, Miscellaneous Paper 113, 199p.

Fortescue, John A.C.
1983: A Small Scale Study of Acid Lakes in the Area North of Lake Wanapitei, District of Sudbury; p.161-163 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Lovell, H.L., and Caine, T.W.
[illegible] Lake Timiskaming Rift Valley; Ontario Department of Mines, Miscellaneous Paper 39, 16p.

Mossman, D.J., and Harron, G.A.
1983 Origin and Distribution of Gold in the Huronian Supergroup, Canada—The Case for Witwatersrand-Type Paleoplacers; Precambrian Research, 20, p.543-583.

Owsiacki, L.
1983 Geology of the McLean Lake Area; p.250-252 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Riley, J.L.
1983 Peatland Inventory Project; p.115-121 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Rowell, W.F., and Edgar, A.D.
1983 Geochemistry and Economic Potential of the Nipissing Gabbro; Grant 100, p.153-157 *in* Geoscience Research Grant Program, Summary of Research, 1982-1983, edited by E.G. Pye, Ontario Geological Survey, Miscellaneous Paper 113, 199p.

Russell, D.J.
1981 The Paleozoic Outliers on the Canadian Shield; p.117-120 *in* Summary of Field Work, 1981, by the Ontario Geological Survey, edited by John Wood, O.L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 100, 255p.

Russell, D.J.
1983: Geology of the Palezoic Outliers on the Canadian Shield; p.104-106 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Thomson, R.
1965: Casey and Harris Townships, District of Timiskaming; Ontario Department of Mines, Geological Report 36, 77p. Accompanied by Map 2066, scale 1:31 680 or 1 inch to ½ mile.

# Report of Activities 1983
# Sault Ste. Marie Resident Geologist Area, Northeastern Region

**Gerald Bennett[1] and E.J. Leahy[2]**

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## Introduction

In 1983, the mineral exploration industry recognized the significance of the discovery of the major gold desposits north of Trans Canada Highway 17 near Hemlo between the towns of Marathon and White River. By late 1983, the Hemlo deposits were known to contain a total of some 76.4 million short tons of gold ore at a grade of 0.24 ounce per ton, according to published accounts, and drilling is continuing.

Noranda Mines Limited is well underway with the construction of a 3500 tonne-per-day mine and mill complex on the Goliath Gold Mines property. Site preparation has begun on the 1000 tonne-per-day Teck-Corona deposit, and Lac Minerals Limited has announced that its Williams property can support a 2500 to 3500 tonne-per-day operation.

Geologists soon realized that these deposits were unlike the typical quartz-carbonate vein type lodes of the established gold mining camps of Ontario. The Hemlo gold deposits are apparently stratabound and generally considered to be syngenetic. The host rocks are relatively high-grade metamorphic rocks of sedimentary or pyroclastic origin (*see* the report of the Thunder Bay Resident Geologist in this volume for a more complete description of the Hemlo gold deposits, as well as mining and exploration developments in the Thunder Bay Mining Division).

The recognition of the importance of the Hemlo deposits, and also that they are of a type previously unknown in the region, led to levels of claim staking and exploration activity in the Sault Ste. Marie Mining Division which have not been seen since the discovery of the Elliot Lake uranium deposits in the early 1950s.

## Resident Geologist's Activities

The staff of the Sault Ste. Marie Resident Geologist's Office consists of B. Fremlin, Secretary; E.J. Leahy, Resource Geologist; and L.J. Ashick, geological assistant. J.D. Robinson was employed on a contract basis as a geological assistant until the fall of 1983. We were saddened by the death of Mr. Robinson in a traffic accident on November 13, 1983.

J.P. Donald joined the staff on a contract basis as Sault Ste. Marie Drill Core Library Geologist in May, 1983. He was assisted for part of this time by D. Messenger.

The use of the office facilities by the public increased more than 3-fold during 1983. As a result, much more of the Resident Geologist's time was spent responding to requests for information and consultation. In addition to regular office duties, the Resident Geologist visited 22 active properties and 7 inactive occurrences, and acted in a liaison function for the Ontario Ministry of Natural Resources during the construction of the Sault Ste. Marie Drill Core Library.

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[1] Resident Geologist, [2] Resource Geologist, Ontario Ministry of Natural Resources, Sault Ste. Marie.

In addition to these duties, the Resident Geologist led a field trip over the Thessalon area, sat on a committee pertaining to exploration in candidate parks, and took part in 3 geological field trips in Ontario.

Work was continued on a geochronological study of Huronian volcanic rocks in conjunction with scientists of the Royal Ontario Museum, and on a study of lower Huronian stratigraphy.

Assistance to office visitors accounted for the largest part of the Resource Geologist's time during 1983. Additional duties included overseeing and assisting 1 geological assistant in the production of Geological Data Inventory Folios, of which 12 were completed this year. The Resource Geologist assisted the Sault Ste. Marie Museum with a presentation of the basic landforms of the Sault Ste. Marie area; assisted a teachers' association with a field trip; lectured to 3 elementary school classes; and carried out field work related to field trips, sample collecting, and hazardous abandoned mine sites. He also carried out ongoing revisions to the microfiche files of the assessment work library, and data filing in the absence of a full-time secretary.

## The Sault Ste. Marie Drill Core Library

The Sault Ste. Marie Drill Core Library is nearing completion, it should be available for public use by early 1984.

The facility will have a capacity of approximately 107 000 m (350 000 feet) of drill core and a large number of rock samples from the Sault Ste. Marie Mining Division. To date, about 27 500 m (90 000 feet) of drill core have been collected and there are a further 21 000 m (70 000 feet) represented in telescoped sections.

In 1983, the Sault Ste. Marie Drill Core Library Geologist supervised the collection of 6400 m (21 000 feet) of drill core from 8 separate field locations. Current (1983) drilling activity accounted for 3 of these sources. A total of 21 drill core retainment sites were investigated.

## Mining Activity

The Algoma Ore Division of The Algoma Steel Corporation Limited continued production of iron ore at Wawa. From January 1, 1983 to December 1, 1983, 1 031 566 tons of sinter were produced. This tonnage is significantly greater than the 891 610 tons produced during the same period in 1982.

Denison Mines Limited and Rio Algom Mines Limited continued production of uranium oxide at Elliot Lake. The Stanleigh Mine of Rio Algom was reactivated in 1983. The additional production from the Stanleigh Mine will be offset by planned reduction at the Quirke Mine.

Denison Mines Limited have carried out successful tests to determine the feasibility of heap leaching chloritic ore. About 20 000 tonnes of this ore will be mined conventionally, stockpiled underground, and trickle leached.

Renabie Mines Limited continued production of gold from their Leeson Township deposit. In 1983, Sungate Resources Limited, the owner of the Renabie Mine, signed an agreement with Barrick Resources Corporation and Cullaton Lake Gold Mines Limited for the joint ownership of the mine. The management of the Renabie Mine has been undertaken by Camchib Resources Limited.

Early in 1983, the working life of the Renabie Mine was significantly extended by the discovery of a substantial tonnage of relatively high-grade ore near the 3100-foot level. A rampway is being developed to extract this material. The milling problems which depressed earnings during the first months after the start-up are reported to have been overcome. Cut-and-fill mining methods will be employed to reduce dilution.

The Northern Miner of December 1, 1983 reported that Royal Gold and Silver Corporation had entered into an agreement with Sill Lake Silver Mine Incorporated, a private Sault Ste. Marie based corporation, to treat 4000 tons of silver-lead ore and tailings at the former Prace Mine in Vankoughnet Township, about 30 km north of Sault Ste. Marie. The article also states that Royal Gold and Silver Corporation is planning to install a 75 ton-per-day beneficiation plant at the Prace mine-site in December 1983.

## Claim Staking Activity

Claim staking activity continued for most of 1983 at the levels that were initiated at the end of 1982. Between January 1, 1983 and December 1, 1983, there were 4626 mining claims recorded in the Sault Ste. Marie Mining Division.

Figure 2 gives a monthly breakdown of claim staking activity in the Sault Ste. Marie Mining Division for most of 1983, and shows how the level of 1983 staking compares with that of previous years.

In addition to ground acquired by staking, Manwa Exploration Services acquired by a lease agreement the mineral rights of the Townships of Raaflaub, Running, Tronsen, Vibert, and the eastern half of Tolmonen.

## Exploration Activity

In 1983, mineral exploration in the Sault Ste. Marie Mining Division was at its highest level since the Sault Ste. Marie Resident Geologist's Office was opened in 1962. Almost all of this work was focussed on the search for gold. In addition to the areas which have traditionally supported gold exploration, such as the Goudreau, Wawa, and Missinabie areas, exploration for gold was being undertaken in the Pukaskwa River area, the Batchewana area, the Mishibishu Lake area, and, of course, what has generally become known as the Hemlo area.

In view of the depressed state of the base-metal markets, it is not surprising that base-metal exploration was not a significant factor in the exploration picture during 1983.

Exploration for uranium was likewise virtually nonexistent.

## Gold

From the Goulais River area to the Hemlo area, gold was the commodity of preference during 1983.

Areas which, because of their relative inaccessibility, have not previously received their share of attention were actively explored.

International Corona Resources Limited began Operation Wawa in 1983. This is a program to explore the 13½ townships acquired from the Algoma Central Railway by Corona Resources Limited. The area of Operation Wawa was flown by the Dighem airborne system followed by ground VLF surveys, prospecting, geochemical sampling, geological mapping, trenching, and sampling.

Tundra Gold Mines Limited staked an initial block of 864 claims in the Pukaskwa River area west of the Operation Wawa ground. A helicopter-supported base camp with up to 20 personnel was maintained in the area most of the field season. Airborne magnetometer, electromagnetic, and radiometric surveys were carried out over the claims, with follow-up ground geophysical surveys, geological mapping, soil geochemical surveys, prospecting, and sampling.

The George Cross Newsletter of September 12, 1983 reported that Tundra Gold Mines Limited had discovered a new gold occurrence in the Abbie Lake area. It was stated that channel samples of 5 feet had returned assays of 2.29, 0.31, 0.55, 0.02, and 0.05 ounces per ton of gold. The gold occurs in tourmaline- and pyrite-bearing quartz veins in a carbonate-rich shear zone and in conglomerate of predominantly volcanic provenance. Tundra Gold Mines Limited completed a diamond drilling program on the occurrence in the fall of 1983.

Westfield Minerals Limited continued exploration of their Mishibishu Lake property in 1983 as a joint venture with Windarra Minerals Limited.

During the 1983 field season, Westfield Minerals Limited carried out additional geological mapping, a gradiometer survey, soil geochemical surveys, trenching, and sampling. A diamond drilling program was completed on the old Hollinger and Amichi showings. The George Cross Newsletter of January 11, 1983 reports the presence of a stratabound, pyritic, gold-bearing unit which is being evaluated.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports
G.R. 233
G.R. 229

Open File Reports
O.F.R. 5430

Preliminary Maps - Geological Series
P.2580
P.2681
P.2682
P.2683
P.2684

Preliminary Maps - Data Series
G.D.I.F. 27
G.D.I.F. 28
G.D.I.F. 74
G.D.I.F. 75
G.D.I.F. 76
G.D.I.F. 77
G.D.I.F. 111
G.D.I.F. 122
G.D.I.F. 123

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps
2483
2478

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

Miscellaneous Reports
MP 104
MP 113
MP 116

Geological Survey of Canada Open File Reports

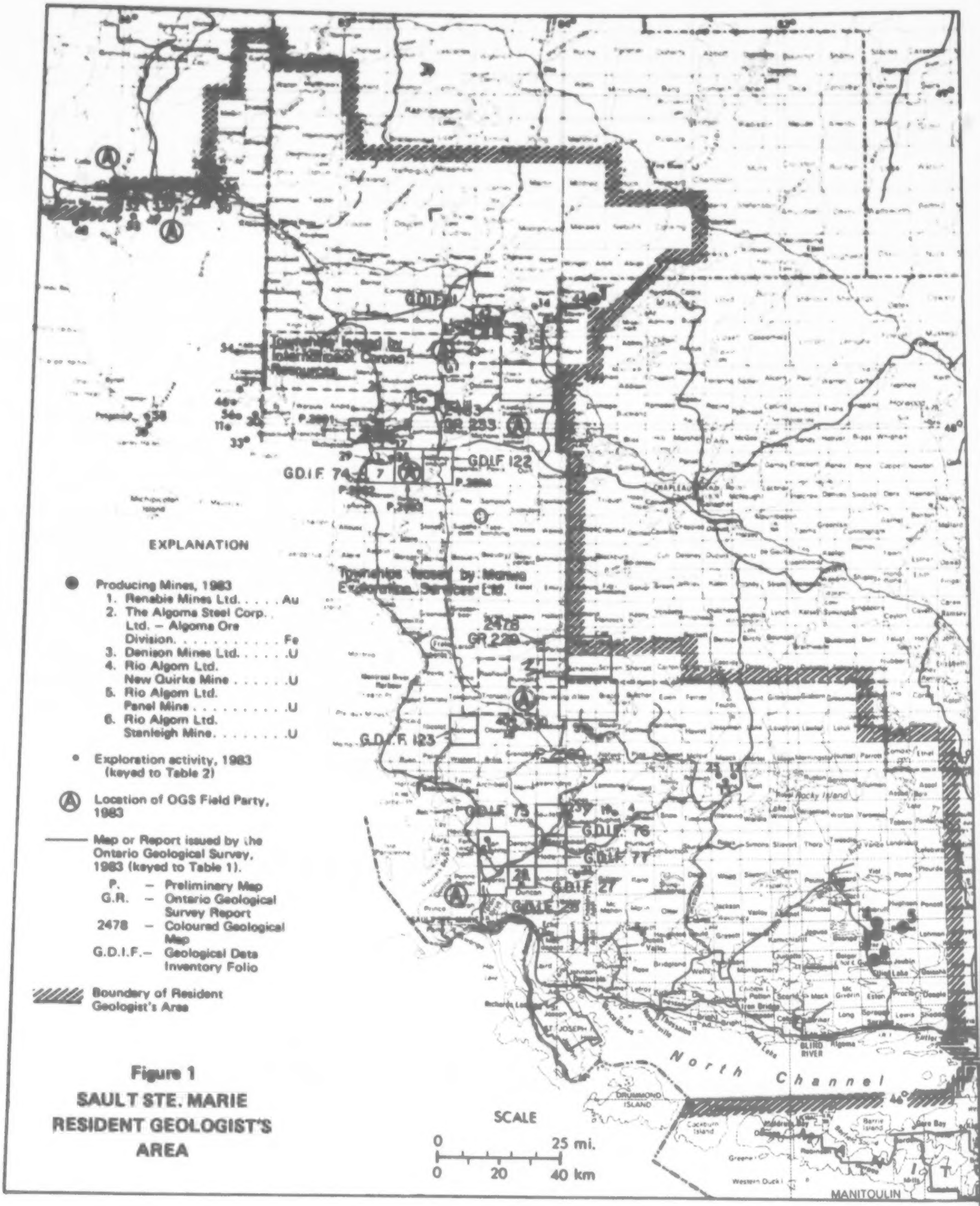
EXPLANATION
● Producing Mines, 1983
1. Renabie Mines Ltd. . . . . . Au
2. The Algoma Steel Corp. Ltd. – Algoma Ore Division. . . . . . . . . . . . . Fe
3. Denison Mines Ltd. . . . . . U
4. Rio Algom Ltd. New Quirke Mine . . . . . . U
5. Rio Algom Ltd. Panel Mine . . . . . . . . . . U
6. Rio Algom Ltd. Stanleigh Mine. . . . . . . . U
• Exploration activity, 1983 (keyed to Table 2)
Ⓐ Location of OGS Field Party, 1983
Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 1).
P. – Preliminary Map
G.R. – Ontario Geological Survey Report
2478 – Coloured Geological Map
G.D.I.F. – Geological Data Inventory Folio
▨ Boundary of Resident Geologist's Area
Townships leased by International Corona Resources
Townships leased by Manwa Exploration Services Ltd.
GDIF 121
GDIF 122
G.D.I.F. 74
G.D.I.F. 123
GDIF 75
G.D.I.F. 76
G.D.I.F. 77
G.D.I.F. 27
G.D.I.F. 28
GR 233
GR 229
2478
P.2681
P.2682
P.2683
P.2684
P.2680
CHAPLEAU
BLIND RIVER
North Channel
ST. JOSEPH
DRUMMOND ISLAND
Cockburn Island
MANITOULIN
Michipicoten Island
Rocky Island
46°
SCALE
0 25 mi.
0 20 40 km

Figure 1
SAULT STE. MARIE
RESIDENT GEOLOGIST'S
AREA

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1. | Amhawk Resources Inc. | Geological, Geophysical Surveys, Dambrossio Township |
| 2. | Archibald, F.T. | Geophysical Survey, Jacobson Township |
| 3. | Bel Air Resources Ltd. | Drilling, Geochemical Survey, Bomby Township |
| 4. | Billingsley, R., Watkins, J. | Trenching, Prospecting, Jollineau Township |
| 5. | B K K Mining & Explorations Ltd. | Sampling, Trenching, Galbraith Township |
| 6. | Campbell, C.W. | Manual labour, Mechanical Equipment, Gapp Township |
| 7. | Canabec Resources Ltd. | Geophysical Surveys, Drilling, Rabazo Township |
| 8. | Canamax Resources Inc. | Geological Mapping, Drilling, Finan Township |
| 9. | Canamax Resources Inc. | Geological Mapping, Drilling, Sagard Township |
| 10. | Coresem Resources Inc. | Geological Survey, White Lake N&S area |
| 11. | Central Crude Limited | Geophysical, Geochemical, Geological Surveys, Trenching, Mishibishu Lake Area |
| 12. | Closs, Wilf | Geophysical Survey, Rollins Township |
| 13. | Couturier, Roger | Geophysical Survey, Rollins Township |
| 14. | Cullen, Robert | Geological, Airborne, Geophysical Surveys, Meath & West Townships |
| 15. | Dasher Resources Ltd. | Drilling, Esquega Township |
| 16. | Dejour Mines Ltd. | Geophysical Surveys, Geological Mapping, Davieaux Township |
| 17. | Dunraine Mines Ltd. | Geochemical, Geological Surveys, McMurray Township |
| 18. | Falconbridge Limited | Geological Mapping, Drilling, Esquega Township |
| 19. | Fleming, Dennis | Trenching, Prospecting, Hughes Township |
| 20. | Harbinson Resources Ltd. | Geochemical, Geological, Geophysical Surveys, Mishibishu Lake Area |
| 21. | Haugeneder, John | Trenching, Prospecting, Chesley Township |
| 22. | Hawley, R.G. | Airborne Geophysical Surveys, White Lake South Area |
| 23. | Highland Crow Resources | Geological, Geophysical Survey, Drilling, Daumont Township |
| 24. | H R C Hemlo Ltd. | Airborne Geophysical Survey, White Lake Area |
| 25. | Hunter, Bob | Geophysical Survey, Rollins Township |
| 26. | International Corona Resources Ltd. | Geophysical,Geological, Geochemical Surveys, Michipicoten Area |
| 27. | Lac Minerals Ltd. | Geological, Geophysical, Geochemical Surveys, Drilling, Hemlo Area |
| 28. | Longbow Explorations Ltd. | Power Stripping, Drilling, Geological Mapping, Jarvis Township |
| 29. | Longhurst, Gerry | Trenching, Road Building, Rabazo Township |
| 30. | Massive Energy Ltd. | Geological, Geochemical, Geophysical Surveys, Davieaux and Desbiens Townships |
| 31. | McGowan, R. | Power Stripping, White Lake North Area |
| 32. | McNellen Resources, Cavendish Resources | Diamond Drilling, Site Preparation, Finan Township |
| 33. | Mid North Engineering Ltd. | Airborne Geophysics, Pilot Harbour Area |
| 34. | Monica Resources | Airborne Geophysical Surveys, White Lake South Area |
| 35. | Monk Gold Mines | Geological Mapping, Trenching, Drilling, Rabazo Township |
| 36. | Narex Ore Search Ltd. | Airborne Geophysical Survey, Bomby Township |
| 37. | Noranda Exploration Ltd. | Geophysical Surveys, Gapp Township |
| 38. | Noranda Exploration Ltd. | Geophysical Survey, Homer Township |
| 39. | Noranda Exploration Ltd. | Drilling, Jacobson Township |
| 40. | Ontex Resources Ltd. | Geophysical Surveys, Geological Mapping, Davieaux Township |
| 41. | Pango Gold Mines Ltd. | Geological Mapping, McMurray Township |
| 42. | Potvin, Jean | Geophysical and Geological Surveys, Jacobson Township |

TABLE 2 Continued

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 43. | Potvin, Jean | Geophysical, Geological Surveys, Jacobson Township |
| 44. | Renabie Mines Ltd. | Drilling, Rennie Township |
| 45. | Rose Resources Corp. | Geophysical Survey, Brothers Township |
| 46. | Sanderson, C. D. | Trenching, Prospecting, Mishibishu Lake Area |
| 47. | Schiralli, Rocco A. | Drilling, Geological, Geophysical Surveys, Assays, Bomby Township |
| 48. | Schiralli, Rocco A. | Geophysical Survey, Mussy Lake Area |
| 49. | Schiralli, Rocco A. | Geophysical Survey, White Lake North Area |
| 50. | Score Resources Ltd. | Drilling, Geological Mapping, Geophysics, White Lake South Area |
| 51. | Sill Lake Silver Mine Inc. | Prospecting, Trenching, Vankoughnet Township |
| 52. | T.G.R. Resources Ltd. | Airborne Geophysical Survey, Bomby Township |
| 53. | Tipperary Resources Ltd. | Airborne Geophysical Survey, Herrick Lake Area |
| 54. | Tundra Exploration | Airborne Geophysics, Drilling, Geological, Geochemical Surveys Pukaskwa River Area |
| 55. | Vega Gold Exploration Ltd. | Geophysical, Geological Surveys, Jacobson Township |
| 56. | Wasabi Resources Ltd. | Geophysical, Geochemical Surveys, Mishibishu Lake Area |
| 57. | Westfield Minerals Ltd. | Geological, Geophysical, Geochemical Surveys, Drilling, Mishibishu Lake Area |
| 58. | White, Vance | Airborne Geophysical Surveys, Homer Township |

Central Crude Limited acquired a 101-claim block southwest of Mishibishu Lake. Airborne geophysical surveys were flown followed by ground surveys and prospecting. The company reported a gold-bearing zone about 200 feet wide which could be traced for 400 feet. Surface samples yielding up to 0.319 ounce gold per ton were reported (George Cross Newsletter, September 6, 1983). The Northern Miner of November 3, 1983 reported that Central Crude had obtained up to 0.744 ounce gold per ton in grab samples and that a geophysical survey had outlined a conductor with overlapping geochemical anomalies over 4000 feet.

Wasabi Resources Limited have completed a reconnaissance survey of their claim group south of Mishibishu Lake. Prospecting, geophysical, and geochemical surveys were carried out. Wasabi Resources Limited is in a joint venture with Chavin of Canada and O'Brien Energy and Resources Limited.

Windarra Minerals Limited and Fourty-Niner Properties Limited hold 56 claims east of White Lake. Ground electromagnetic, geological, and soil geochemical surveys were carried out in 1983. Grab samples yielding 0.14 and 0.45 ounce gold per ton were reported in the George Cross Newsletter of September 7, 1983.

Score Resources Limited carried out geological, geophysical, and soil geochemical surveys on a block of claims south of the Windarra property. A diamond drilling program was completed on the Score property in the fall of 1983.

Lac Minerals Limited continued exploration of their block of over 700 claims which extend eastward from the Hemlo gold deposits. Geological mapping, basal till and soil geochemical surveys, IP surveys, and diamond drilling have been carried out. Lac Minerals Limited has a large base camp on Cedar Lake and plans to conduct a 5-year evaluation of the claim group.

Dasher Resources Limited and J-Q Resources Limited carried out ground geophysical surveys and prospecting on their 52-claim group in Esquega Township. A diamond drilling program was carried out on the old Atnel gold occurrence.

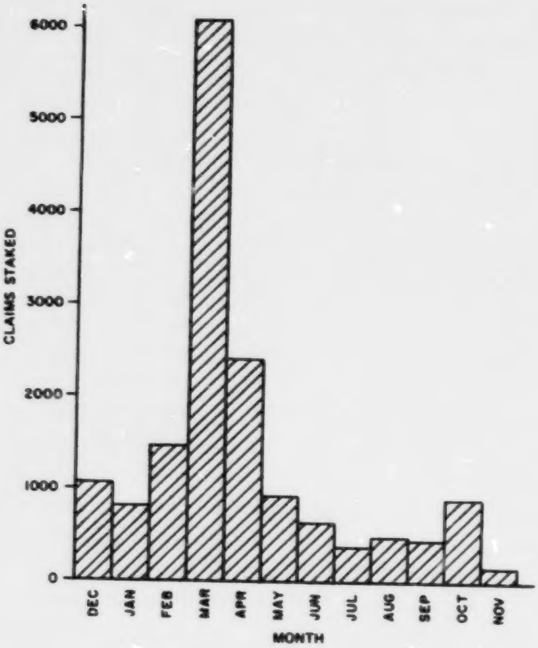

Figure 2 — Number of Claims Staked in the Sault Ste. Marie Mining Division in 1983.

Monk Gold Mines Limited was active on their property near Scott Falls in Rabazo Township. Trenching, sampling, geological mapping, and a diamond drilling program were completed by late 1983.

Canamax Resources Incorporated optioned the Kremzar gold property. Geological mapping, surface sampling, and diamond drilling were carried out in 1983.

McNellen Resources Incorporated in joint venture with Cavendish Resources Limited continued work on the Magino gold mine (a past producer) in Finan Township. An electrical substation was installed on the property in the fall. McNellen Resources Incorporated has announced an intention to bring the deposit into production (Northern Miner, July 15, 1983).

ROK Engineering Limited continued work on their Cline Lake gold property in Jacobson Township. An induced polarization survey and a soil geochemical survey were conducted in the summer of 1983. The project is now under the management of Cline Development Corporation which is listed on the Vancouver Stock Exchange.

In 1983, Massive Energy Limited optioned 16 unpatented claims in the Batchewana area from Sault Ste. Marie prospectors. A large block of additional claims in Davieux and Desbiens Townships was acquired by staking. Geological mapping, geochemical surveys, prospecting, stripping, and trenching were done during the 1983 field season. A diamond drilling program is planned for 1984.

Ontex Resources Limited carried out airborne geophysical surveys followed by ground geophysics, geological mapping, and prospecting over a 248-claim group in Davieux Township in the Batchewana area. A diamond drilling program is planned (Northern Miner, November 17, 1983).

Highland Crow Resources Limited, Quinterra Resources Limited, and Claymore Resources Limited continued work on their group of about 100 claims in Gaudette and Daumont Townships in the Goulais River area. Geological mapping, self potential, and VLF surveys were carried out along with prospecting and sampling. A diamond drilling program was completed in November 1983.

## Base Metals

Longbow Explorations Limited acquired the property of the Victoria Silver Mining Company in 1983. This block of old patents includes the Jardun Mine, a former lead-zinc-silver producer near Sault Ste. Marie. Longbow Explorations Limited also holds a large group of unpatented claims in Jarvis Township. During the summer of 1983, Longbow Explorations Limited carried out geological mapping, trenching, prospecting, airborne geophysics, and a diamond drilling program.

Canamax Resources Incorporated completed about 2500 m (4000 feet) of drilling on their Cobre Lake property in Sagard Township. The company is evaluating Upper Huronian rocks for their copper and gold potential.

Table 2 summarizes the mineral exploration activity in the Sault Ste. Marie Mining Division in 1983.

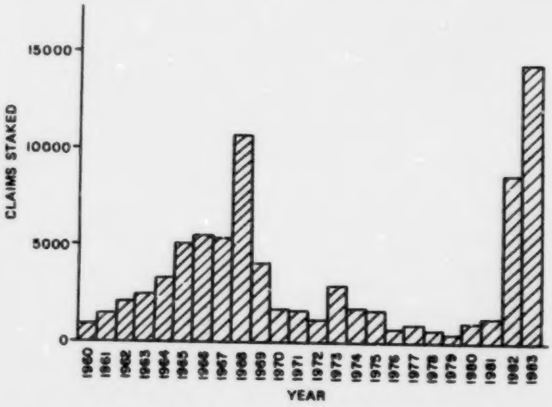

Figure 3 — Number of Claims Staked in the Sault Ste. Marie Mining Division from 1960 to December 1, 1983.

# SAULT STE. MARIE — NORTHEASTERN REGION

TABLE 3

## ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

### SAULT STE. MARIE MINING DIVISION

AEM-Airborne Electromagnetic
AMAG-Airborne Magnetometer
ARAD-Airborne Radiometric
D-Donated
DD-Diamond Drill
DDH-Diamond Drill Hole
EM-Electromagnetic Survey
G-Ground Survey
GEM-Ground Electromagnetic

GL-Geological Survey
GMAG-Ground Magnetometer
GEOCHEM-Geochemical
GRAD-Ground Radiometric
P-Induced Polarization
SA-Sampling Assays
Str-Stripping
VLF-Very Low Frequency

Ag-Silver
Au-Gold
BM-Base Metals
Cu-Copper
Fe-Iron
Mo-Molybdenum
Ni-Nickel
S-Sulphur
W -Tungsten

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | File Number |
|---|---|---|---|---|---|---|---|
| Abotossaway | 42C/2 | Ego Resources L. | Au,BM | D | DDH,GL,Assays | 1980 | Abotossaway 0027 |
| Abotossaway | 42C/2 | Ego Ms. L. | Au,BM | D | GL,DDH | 1978 | Abotossaway 0042 |
| Abotossaway | 42C/2 | Farquhar Ms. Ltd. | Au | Assess. | GEM,GMAG | 1983 | Abotossaway 0041 |
| Abotossaway | 42C/2 | Farquhar Ms. Ltd. | Au | D | DDH,SA,GL,Str | 1983 | Abotossaway 0043 |
| Abotossaway | 42C/2 | Rio Tinto Cdn. E. | Au | | DDH,Assays | 1981 | Abotossaway 0037 |
| Abotossaway | 42C/2 | United Canso Oil & Gas | Au | | GL,Assays | | Abotossaway 0040 |
| Aguonie | 42C/7 | Noranda Exploration Co. Ltd. | Au | Assess. | DDH | 1982 | Aguonie 0028 |
| Anderson | 41J/12<br>41K/9 | Northridge Res. L. | Au,BM | D | Str,SA | 1983 | Anderson 0015 |
| Bolger | 41J/7 | Highland Crow Res. | Au,U | Assess. | GRAD,GL,SA | 1982 | Bolger 0057 |
| Bridgeland | 42J/5 | Dolan, Don | Cu | D | Str | 1982 | Bridgeland 0028-A1 |
| Bridgeland | 42J/5 | Dolan, Don | Cu | D | Str | 1982 | Bridgeland 0028-B1 |
| Bright | 41J/3 | Conwest Expl. Co. | U | D | GL,DDH | 1978 | Bright 0011 |
| Bruyere | 42C/1 | Kingswood Expl. L. | Au | D | Str,SA | 1980 | Bruyere 0015 |
| Bruyere | 42C/1 | Kingswood Expl. L. | Au | Assess. | GMAG | 1982 | Bruyere 0016 |
| Bruyere | 42C/1 | Kingswood Expl. L. | Au | Assess. | GEM | 1981 | Bruyere 0017 |
| Bruyere | 42C/1 | Kingswood Expl. L. | Au | Assess. | GEM,GMAG,DDH<br>GL,SA | 1982 | Bruyere 0018 |
| Chabanel | 42C/2 | Algoma Ore Prop. L. | BM | Assess. | DDH | 1981 | Chabanel 0011-B1 |
| Chabanel | 42C/2 | Algoma Steel Corp. | BM | Assess. | GEM | 1982 | Chabanel 0047-A1 |
| Chabanel | 42C/2 | Algoma Steel Corp. | BM | Assess. | GEM | 1982 | Chabanel 0048-A1 |
| Chabanel | 42C/2 | Algoma Steel Corp. | BM | Assess. | GMAG | 1982 | Chabanel 0048-B1 |
| Cobden | 41J/2<br>41J/6 | Long Lac Mineral Exploration Ltd. | Au,BM | Assess. | DDH | 1983 | Cobden 0019 |
| Corbiere | 42C/2 | Algoma Central Rwy. | Fe,S,BM | D | GEM,GMAG,GL | 1964 | Corbiere 0026 |
| Cowie | 42C/1 | Amax Minerals Ex. | Au | D | AMAG,AEM,DDH | 1982 | Cowie 0016 |
| Debassige | 42C/1 | Algoma Steel Corp. | Au | Assess. | GMAG | 1982 | Debarsige 0014 |
| Debassige | 42C/1 | Algoma Steel Corp. | Au | Assess. | GEM | 1983 | Debassige 0015 |
| Deroche | 41K/9 | Saint Antonio Mng. | BM | D | | 1924 | Deroche 0019-E1 |
| Deroche | 41K/9 | Feldstein,H.E. | Ag,BM | D | DDH | 1973 | Deroche 0025-A1 |
| Deroche | 41K/9 | Algoma Silver Lead | Ag,BM | D | DDH,Str | 1982 | Deroche 0025-B1 |
| Deroche | 41K/9 | Mississagi Mining Co. Ltd. | Ag,BM | D | DDH | 1982 | Deroche 0025-C1 |
| Deroche | 41K/9 | Mattagami Lake Ex. | BK | D | GMAG,GEM | 1980 | Deroche 0026 |
| Deroche | 41K/9 | Algoma Central Rwy. | Ag,BM | D | GL,DDH,SA | 1952 | Deroche 0027 |
| Esquega | 42C/2 | Amax Expl. Inc. | Ni,BM | D | GL,DDH,SA | 1968 | Esquega 0026 |
| Finan | 42C/8 | Mattagami Lake Exp. | | Assess. | GMAG,GEM | 1982 | Finan 0022 |
| Finan | 42C/7 | Noranda Exploration Co. Ltd. | | Assess. | GMAG,GEM | 1982 | Finan 0023-A1 |
| Finan | 42C/8 | Canada Ltd.(108898) | | Assess. | GMAG,GEM,GL | 1982 | Finan 0024 |
| Finan | 42C/7 | Cavendish Investing | | D | GL | 1982 | Finan 0025 |
| Finan | 42C/8 | Magino Gold Property | Au | D | GL,DDH,SA | 1981 | Finan 0026 |

**TABLE 3 Continued**

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | File Number |
|---|---|---|---|---|---|---|---|
| Galbraith | 41J/5 | Bohash, J.J. | | Assess. | SA | 1983 | Galbraith 0013-A1 |
| Glasgow | 42C/8 | Mattagami Lake Exploration | | Assess. | GMAG,GEM | 1982 | Glasgow 0014-A1 |
| Glasgow | 42C/8 | Mattagami Lake Exploration | | Assess. | GMAG,GEM | 1982 | Glasgow 0015 |
| Gould | 41J/6<br>41J/11 | Beaudin, R. | BM | D | Str,Shaft sinking | 1982 | Gould 0017 |
| Haughton | 41J/11 | Beaudin, R. | BM | D | Str,Shaft sinking | 1982 | Haughton 0014 |
| Hughes | 41J/13 | Fleming, D.C. | Ag,BM | D | Str | 1983 | Hughes 0014 |
| Hughes | 41J/13 | Canadian Nickel Co. | Ag,BM | Assess. | AEM,AMAG | 1982 | Hughes 0015 |
| Hughes | 41J/13 | Campbell,C.W. | Ag,BM | Assess. | 6DDH,SA | 1982 | Hughes 0016 |
| Jacobson | 42C/8 | Archibald, F.T | | Assess. | GMAG,GEM,GL | 1982 | Jacobson 0052-B1 |
| Jacobson | 42C/8 | Bliesath, S.K. | Au | Assess. | GMAG,GEM | 1983 | Jacobson 0047 |
| Jacobson | 42C/8 | Potvin, J.C. | Au | Assess. | GEM,GMAG,SA | 1983 | Jacobson 0046 |
| Jacobson | 42C/8 | Potvin, J.C. | Au | Assess. | GEM,GMAG | 1983 | Jacobson 0048 |
| Jacobson | 42C/8 | Potvin, J.C. | Au | Assess. | 8DDH,SA | 1983 | Jacobson 0053-A1 |
| Jacobson | 42C/8 | Mattagami Lk. Exp. | Au,Ag,BM | Assess. | GMAG,GEM,GL,DDH | 1983 | Jacobson 0044 |
| Jacobson | 42C/8 | Mattagami Lk. Exp. | Au,Ag,BM | Assess. | GEM,GMAG,GL | 1983 | Jacobson 0045 |
| Jacobson | 42C/8 | Mattagami Lk. Exp. | | Assess. | GMAG,GEM | 1982 | Jacobson 0050 |
| Jacobson | 42C/8 | Noranda Exploration Co. Ltd. | | Assess. | 3DDH | 1983 | Jacobson 0051 |
| Jacobson | 42C/8 | ROK Engineering | Au | D | GL | 1982 | Jacobson 0042 |
| Jacobson | 42C/8 | ROK Engineering | Au | Assess. | GL,DD,SA | 1983 | Jacobson 0049 |
| Jacobson | 42C/8 | Vega Gold Exp. L. | Au | Assess. | GMAG,GEM,GL | 1983 | Jacobson 0043 |
| Jacobson | 42C/8 | Vega Gold Exp. L. | Au | Assess. | 3DDH,SA | 1983 | Jacobson 0052-A1 |
| Jarvis | 41K/9 | Longbow Expl. Inc. | Ag,Au,BM | D | SA,Str | 1982 | Jarvis 0021-A1 |
| Jarvis | 41K/9 | Longbow Expl. Inc. | Ag,Au,BM | D | SA,Str | 1982 | Jarvis 0021-B1 |
| Jarvis | 41K/9 | Longbow Expl. Inc. | Au,Ag,BM | D | Str | 1982 | Jarvis 0021-C1 |
| Jarvis | 41K/9 | Longbow Expl. Inc. | Au,Ag,BM | D | SA | 1983 | Jarvis 0021-D1 |
| Jarvis | 41K/9 | Longbow Expl. Inc. | Au,Ag,BM | D | SA | 1983 | Jarvis 0022 |
| Kamischisitit | 41J/6 | Crownbridge Copper | BM | D | DD,GL,SA | 1965 | Kamichisitit 0038 |
| Kincaid | 41N/2 | Richards, W.J. | | D | SA | 1983 | Kincaid 0025 |
| Leeson | 42B/5 | Camex Ms. L. | Au | | GL | 1947 | Leeson 0024-B1 |
| Leeson | 42B/5 | Campbell, R. | Au | D | Str | 1974 | Leeson 0021-B1 |
| Leeson | 42B/5 | Campbell, R. | Au | | GL | 1954 | Leeson 0025-A1 |
| Leeson | 42B/5 | Campbell, R. | Au | | GL | 1950 | Leeson 0025-B1 |
| Leeson | 42B/5 | Coniagas Ms. L. | Au | D | GEM,DD,SA | 1981 | Leeson 0020 |
| Leeson | 42B/5 | Coniagas Ms. L. | Au | D | DD,SA | 1946 | Leeson 0021-A1 |
| Leeson | 42B/5 | Dulama G. Ms. L. | Au | | DDH | 1947 | Leeson 0023-C1 |
| Leeson | 42B/5 | Dulama G. Ms. L. | Au | D | GL,DD | 1951 | Leeson 0026 |
| Leeson | 42B/5 | Ken-Bay G. Ms. L. | Au | | DDH | 1947 | Leeson 0024-A1 |
| Leeson | 42B/5 | Mattagami Lake Exp. | | Assess. | GMAG,GEM | 1982 | Leeson 0027 |
| Leeson | 42B/5 | Nudulama Ms. L. | Au | | I.P. | 1975 | Leeson 0022 |
| Leeson | 42B/5 | Nudulama Ms. L. | Au | D | DDH | 1975 | Leeson 0023-A1 |
| Lendrum | 41N/15 | Algoma Steel Corp. | BM | Assess. | GEM. | 1982 | Lendrum 0014-A1 |
| Lendrum | 41N/15 | Funk, H. | Au,Ag | Assess. | GEM,SA | 1982 | Lendrum 0014-B1 |
| Meath | 42C/8 | Mattagami Lk. Exp. | Au,BM | Assess. | DDH | 1982 | Meath 0021-B1 |
| Meath | 42C/8 | Mattagami Lk. Exp. | BM,Au | Assess. | GEM,GMAG,GL | 1983 | Meath 0022 |
| Meath | 42C/8 | Mattagami Lk. Exp. | Au,BM | Assess. | GEM,GMAG,GL | 1983 | Meath 0023 |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | File Number |
|---|---|---|---|---|---|---|---|
| Meath | 42C/8 | Noranda Expl. C.L. | Au,BM | Assess. | DDH,SA | 1982 | Meath 0024 |
| Meath | 42C/8 | Sulphide Synd. | Au | Assess. | GMAG,GEM,GL | 1982 | Meath 0021-A1 |
| Meath | 42C/8 | Sulphide Synd. | Au | Assess. | GMAG,GEM | 1983 | Meath 0025 |
| McMurray | 41N/15 | Darwin Gold Ms. L. | Au,Ag | | GL | 1939 | McMurray 0042 |
| McMurray | 41N/15 | Dunraine Ms. L. | Au,Ag | D | GL,DD,SA | 1981 | McMurray 0041 |
| McMurray | 41N/15 | Dunraine Ms. L. | Au | D | DD,SA | 1982 | McMurray 0043 |
| Montgomery | 41J/6 | Consolidated Sannorm | BM | D | DD,SA | 1968 | Montgomery 0024-A1 |
| Montgomery | 41J/6 | Corbold Creek Dev. | BM | D | GL,GMAG,SA | 1975 | Montgomery 0025 |
| Naveau | 41N/15 | Candore Expls. L. | Au | D | GL | 1963 | Naveau 0018 |
| Naveau | 41N/15 | Noranda Expl. C.L. | Au | D | GEM,GMAG | 1982 | Naveau 0019 |
| Parkinson | 41J/6 | Hy-Tower Ms. Inc. | BM | D | DD,Str,SA | 1981 | Parkinson 0017 |
| Poulin | 41J/10 | Utah Mines Ltd. | | Assess. | GMAG,GEM | 1982 | Poulin 0013 |
| Rabazo | 41N/15 | Algoma Steel Corp. | Au,BM | Assess. | GMAG | 1983 | Rabazo 0023 |
| Rabazo | 41N/15 | Algoma Steel Corp. | BM | Assess. | GEM | 1982 | Rabazo 0024 |
| Rabazo | 41N/15 | Algoma Steel Corp. | Au,BM | Assess. | SA | 1982 | Rabazo 0025 |
| Rabazo | 41I/15 | Canabec Exp. Ltd. | Au,BM | Assess. | 3DDH,SA | 1983 | Rabazo 0026-A1 |
| Rennie | 42B/5 | Mattagami Lk. Ex. | Au,BM | Assess. | GEM,GMAG | 1983 | Rennie 0027 |
| Rennie | 42C/8 | Midas Mng. Co. Ltd. | | Assess. | GMAG,GEM | 1982 | Rennie 0029 |
| Rennie | 42B/5 | Renabie Mines Ltd. | | Assess. | 1DDH | 1983 | Rennie 0030 |
| Rennie | 42B/5 | Westfield M. L. | Au,Ag,BM | D | GL,DD,GEOCHEM,<br>SA | 1981 | Rennie 0026 |
| Rennie | 42B/5 | Westfield M. L. | Au,Ag,BM | Assess. | GMAG,GEM,soil<br>Geochem,GL | 1983 | Rennie 0028 |
| Ryan | 41N/2 | Amax Minerals Exp. | Cu,Mo | Assess. | GL,DD,SA | 1983 | Ryan 0033 |
| Ryan | 41N/2 | Jogran Mines Ltd. | Cu,Mo | Assess. | DD,SA | 1982 | Ryan 0032 |
| Ryan | 41N/2 | Jogran Mines Ltd. | Cu,Mo | Assess. | SA | 1981 | Ryan 0034-A1 |
| Ryan | 41N/2 | Rupert, R.J. | Cu,Mo,W | Assess. | GMAG | 1983 | Ryan 0031 |
| Stover | 42C/5 | Mattagami Lake Ex. | | Assess. | GMAG,GEM | 1982 | Stover 0024 |
| Stover | 42C/8 | Mattagami Lake Ex. | | Assess. | GMAG,GEM | 1982 | Stover 0025-A1 |
| Stover | 42B/5 | Noranda Ex. C. L. | Au | Assess. | GMAG,GEM | 1982 | Stover 0023 |
| Varley | 41J/11 | Beaudin, R. | | D | SA | 1983 | Varley 0011-A1 |
| West | 42C/8 | Mattagami Lake Ex. | Au,Ag | Assess. | GMAG,GEM | 1982 | West 0014 |
| West | 42C/8 | Mattagami Lake Ex. | | Assess. | GMAG,GEM | 1982 | West 0015-A1 |
| West | 42C/8 | Mattagami Lake Ex. | | Assess. | GMAG,GEM | 1982 | West 0016-A1 |
| 41N/13NE (Pilot Harbour) | 41N/13 | Noranda Expl. C.L. | Au,Cu | Assess. | GEM,GMAG | 1983 | 41N/13NE-0011 |
| 42C/3SW (Mishibishu Lake) | 42C/3SW | Westfield Minerals | Au | Assess. | GL,SA,VLF,EM | 1981 | 42C/3SW-0017 |
| 42C/12NE (White Lake-S.Part) | 42C/12NE | LongLac Minerals Exploration Ltd. | | Assess. | AMAG,AEM,ARAD,SA | 1982 | 42C/12NE-0015 |
| 42C/12NW (Molson Lake) | 42C/12NW | Harlin Res. L. | Au | Assess. | DDH | 1982 | 42C/12NW-0015 |
| 42C/12NW (Molson Lake) | 42C/12NW | BelAir Resources | | Assess. | GMAG,GEM,GL,Str | 1983 | 42C/12NW-0016 |
| 42C/12NW (Molson Lake) | 42C/12NW | BelAir Resources | | Assess. | GMAG,GEM,GL | 1983 | 42C/12NW-0017-A1 |
| 42C/12NW (Molson Lake) | 42C/12NW | BelAir Resources | Au | D | GL,DD,SA | 1982 | 42C/12NW-0017-C1 |

## Ontario Geological Survey Activities

R.P. Sage continued the long-range geological mapping program in the Wawa area. During 1983, parts of the Townships of Finan, Leclaire, Abotossaway, and Aguonie were mapped at a scale of 1 inch to ¼ mile.

G.M. Siragusa continued a program of geological mapping in the Hemlo area, an area bounded by Latitudes 48°38′N to 48°45′N, and Longitudes 85°38′W to 85°52′30″W. Mapping was carried out at a scale of 1 inch to ¼ mile.

T.L. Muir carried out geological mapping at a scale of 1:15 840 over an area centred approximately 20 km east of the Town of Marathon, west of the intersection of Highways 17 and 614, and including parts of the Districts of Thunder Bay and Algoma.

N.W.D. Massey completed the second year of a 2-year mapping project funded equally by the governments of Canada and Ontario under the Northern Ontario Rural Development Agreement (NORDA). The work was concentrated in the Townships of Nebonaionquet, Lendrum, and the Gros Cap Indian Reserve. Geological mapping was done at a scale of 1:15 840.

E.C. Grunsky continued a synoptic study of the Batchawana area begun in 1981. The study includes an examination of the stratigraphy, chemistry, geochronology, and structure of the Archean supracrustal rocks and surrounding felsic intrusive rocks.

John A.C. Fortescue and Jeanette Lourim conducted a small-scale mineral resource appraisal and environmental geochemical survey in the Batchawana area in the fall of 1983. This is a regional geochemical orientation survey over an area of about 1000 km². Lake sediment and stream sediment samples were analyzed for a suite of elements.

In 1983, John A.C. Fortescue completed lake sediment sampling for a detailed, interdisciplinary study of the element abundance and diatom inferred pH relationships of a group of lakes about 40 km east of Wawa.

D.G.F. Long and T.R. Lloyd studied the placer gold potential of basal Huronian strata of the Elliot Lake Group in the Sudbury area during the summer of 1983. The western limit of the study area was Long Township in the Sault Ste. Marie Mining Division.

W. Meyer completed the field component of a study of the gold content of Lower Huronian quartz-clast conglomerates between Sault Ste. Marie and Elliot Lake.

The latter 2 studies were initated by the Ontario Ministry of Natural Resources, Northeastern Region, and funded by the Ontario Ministry of Northern Affairs.

A brief outline of these and other Ontario Geological Survey field work activities for 1983 can be found in Wood *et al.* (1983).

## Publications and Theses Added to the Sault Ste. Marie Resident Geologist's Library During 1983

Booth, Kenneth D.
1983: Petrography and Chemistry of the Three-Mile Post Anomaly, Jacobson Township, District of Algoma, Ontario; Unpublished B.Sc. Thesis, Carleton University, 42p.

Calvert, Thomas, H.
1983: Petrography and Geochemistry of an Archean Volcanic Sequence of the Josephine Area, Wawa, Ontario; Unpublished B.Sc. Thesis, Brock University, 69p.

Dance, Douglas
1983: Geology, Petrology and Interpretation of Copper Occurrences in the Lorrain Formation near Desbarats, Ontario; Unpublished B.Sc. Thesis, University of Western Ontario, 90p.

Hattori, K., Campbell, F.A., and Krause, R.H.
1983: Sulphur Isotope Abundances in Aphebian Clastic Rocks: Implications for the Coeval Atmosphere; Nature, Volume 302, Number 5906, p.323-326.

Johnson, Mark D.
1983: The Origin and Microfabric of Lake Superior Red Clay; Journal of Sedimentary Petrology, Volume 53, Number 3, p.0859-0873.

Lockwood, M.B.
1983: The Nature and Significance of Chloritoid in Footwall Basalt of the Josephine Iron Formation of the Michipicoten Area, Algoma District, Ontario; Unpublished B.Sc. Thesis, University of Western Ontario, 75p.

Miall, Andrew D.
1983: Glaciomarine Sedimentation in the Gowganda Formation (Huronian), Northern Ontario; Journal of Sedimentary Petrology, Volume 53, Number 2, p.0477-0491.

Morton, R.L., and Nebel, M.
1983: Physical Character of Archean Felsic Volcanism in the Vicinity of the Helen Iron Mine, Wawa, Ontario, Canada; Precambrian Research, Volume 20, p.39-62.

Nevanlinna, H., and Pesonen, L.J.
1983: Late Precambrian Keweenawan Asymmetric Polarities as Analyzed by Axial Offset Dipole Geomagnetic Models; Journal of Geophysical Research, Volume 88, Number B1, p.645-658.

Percival, J.A., and Krogh, T.E.
1983: U-Pb Zircon Geochronology of the Kapuskasing Structural Zone and Vicinity in the Chapleau-Foleyet Area, Ontario; Canadian Journal of Earth Sciences, Volume 20, p.830-843.

Studemeister, P.A.
1983: The Greenschist Facies of an Archean Assemblage near Wawa, Ontario; Canadian Journal Earth Sciences, Volume 20, p.1409-1420.

## Reference

Wood, J., White, O.L., Barlow, R.B., and Colvine, A.C.
1983: Summary of Field Work, 1983, by the Ontario Geological Survey; Ontario Geological Survey, Miscellaneous Paper 116, 313p.

# Report of Activities 1983
# Sudbury Resident Geologist Area, Northeastern Region

**J.M. Martins**[1]

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## Introduction

The Sudbury Resident Geologist's Office is staffed by R. Adlington, Resource Geologist; P.E. Giblin, Acting Mineral Resources Co-ordinator, Northeastern Region; J.M. Martins, Acting Resident Geologist; and Y.M. Paquette, Secretary.

Exploration in the area continued to be directed principally towards gold deposits, and showed an increase over the previous year's level of activity.

Mining activity also took on a more positive note with both of the major companies in the area, Inco Limited and Falconbridge Limited, operating at about 60% full production capacity. Falconbridge Limited resumed operations in January after a 6-month shutdown, and Inco Limited followed suit in April after 10 months of inactivity. Westfield Minerals Limited is in the process of constructing a mill on its Scadding Township gold property, and production at the rate of 200 tons per day is expected to begin shortly.

## Resident Geologist's Activities

R. Adlington continued compilation of the Geological Data Inventory Folio series which summarizes exploration and other data on a township basis. A total of 41 Folios have been produced of which 34 are published. A majority of the townships in the Sudbury Resident Geologist's Area are now covered either by Geological Data Inventory Folios or by Data Series Maps.

With special project funding from the Precambrian Section of the Ontario Geological Survey, J.M. Martins mapped Snider Township at a scale of 1:15 840 (1 inch to ¼ mile), and continued a detailed study of granites intruding the Sudbury Igneous Complex. P.E. Giblin continued mapping parts of Garson Township at a scale of 1:15 840.

The staff were also involved in numerous mine and exploration project visits, and examinations of mineral occurrences. As part of their normal duties the staff responded to many requests for information from industry, government agencies, and the public; participated in land-use planning projects; and led field trips for industry, university, and government groups.

During 1983, the assessment files stored in the Sudbury office were microfilmed. Assessment records and government publications (excluding maps) are now available for viewing either as microfiche or printed copy.

## Mining Activity

As in previous years, mining activity in the area was dominated by production of nickel, copper, and precious metals from the Sudbury area mines of Falconbridge Limited and Inco Limited. Other commodities produced included uranium, silica, dolomite, sand and gravel, decorative stone, and oil.

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[1] Acting Resident Geologist, Ontario Ministry of Natural Resources, Sudbury.

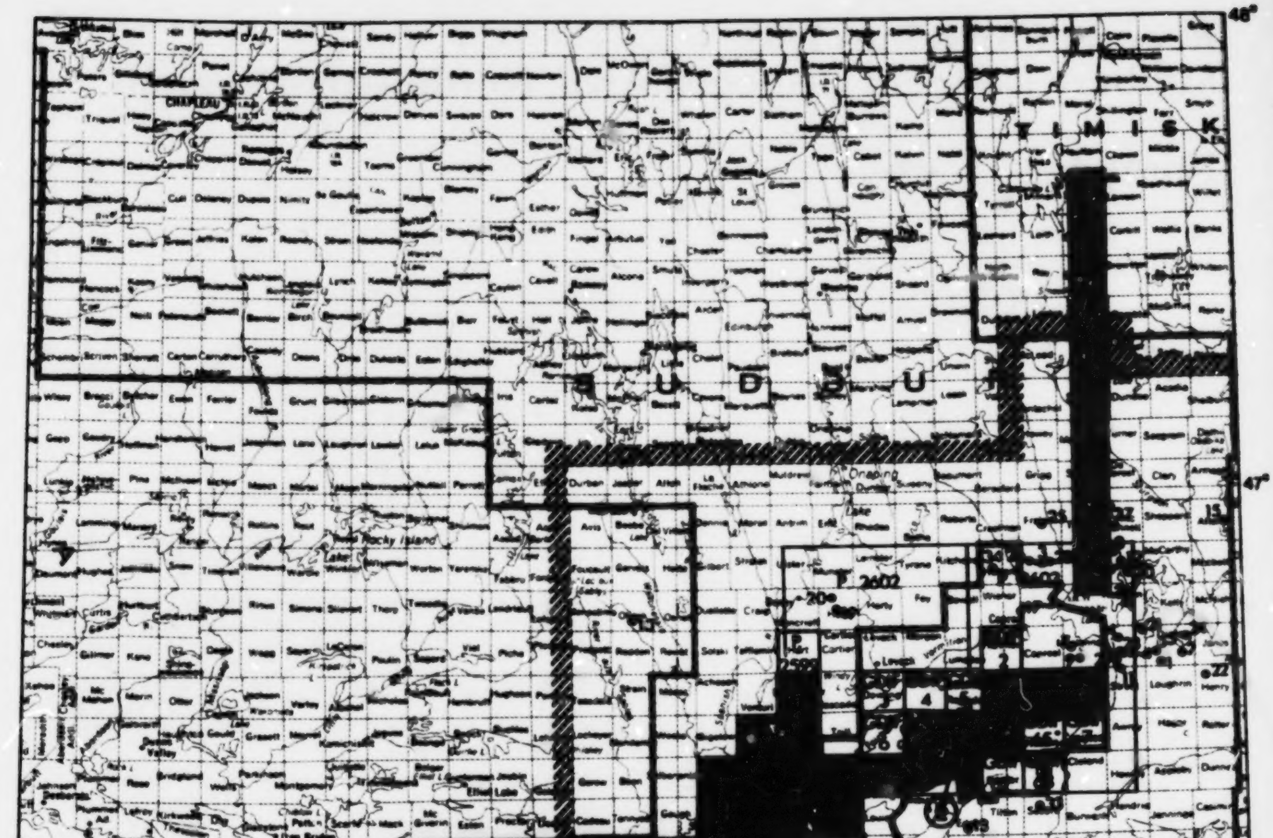
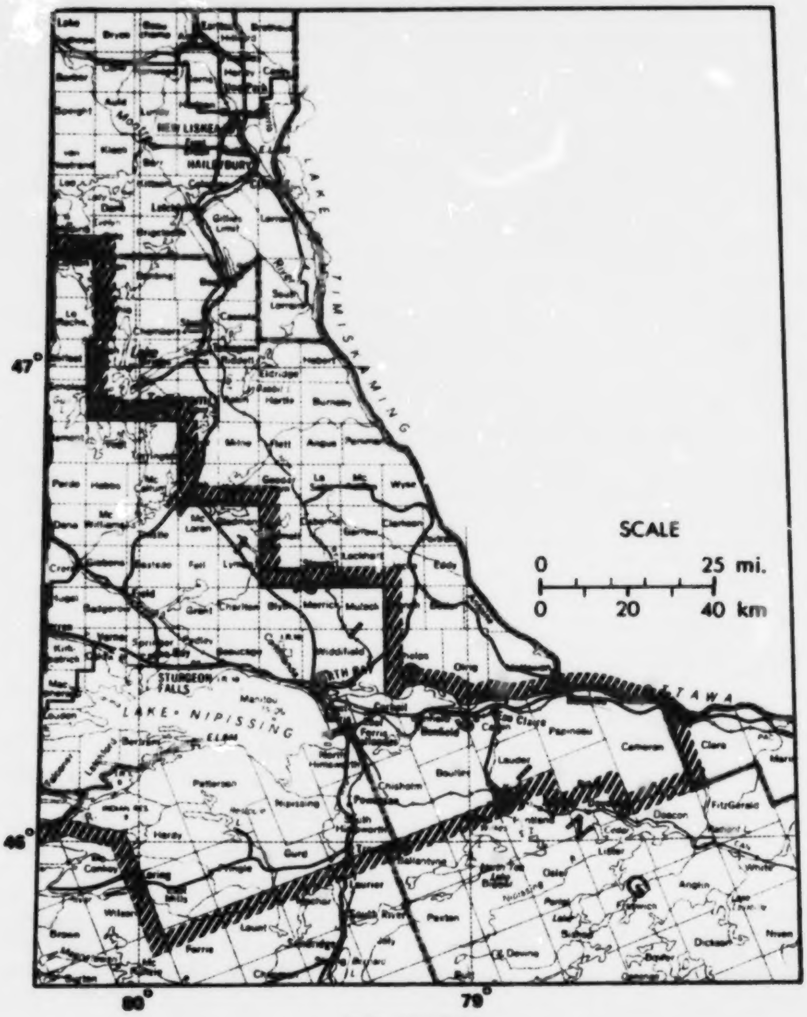

48°
47°
46°
45°
84°
83°
82°
81°
T I M I S K
S U D B U R
CHAPLEAU
P 2602
North Channel
BLIND RIVER
DRUMMOND ISLAND
Cockburn Island
GDIF 71
GDIF 101
GDIF 107
GDIF 109
GDIF 110
MANITOULIN ISLAND
Georgian Bay
LAKE HURON
SCALE
0 25 mi.
0 20 40 km

Figure 1
SUDBURY
RESIDENT GEOLOGIST'S
AREA

Figure 2
SUDBURY RESIDENT GEOLOGIST'S AREA


NEW LISKEARD
HAILEYBURY
LAKE TIMISKAMING
STURGEON FALLS
LAKE NIPISSING
NORTH BAY
OTTAWA
SCALE
0
25 mi.
0
20
40 km
47°
46°
80°
79°

EXPLANATION

● Exploration activity, 1983 (keyed to Table 2)

Ⓐ Location of OGS Field Party, 1983

▨ Boundary of Resident Geologist's Area

— Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 1)

P. – Preliminary Map
GDIF – Geological Data Inventory Folio Map

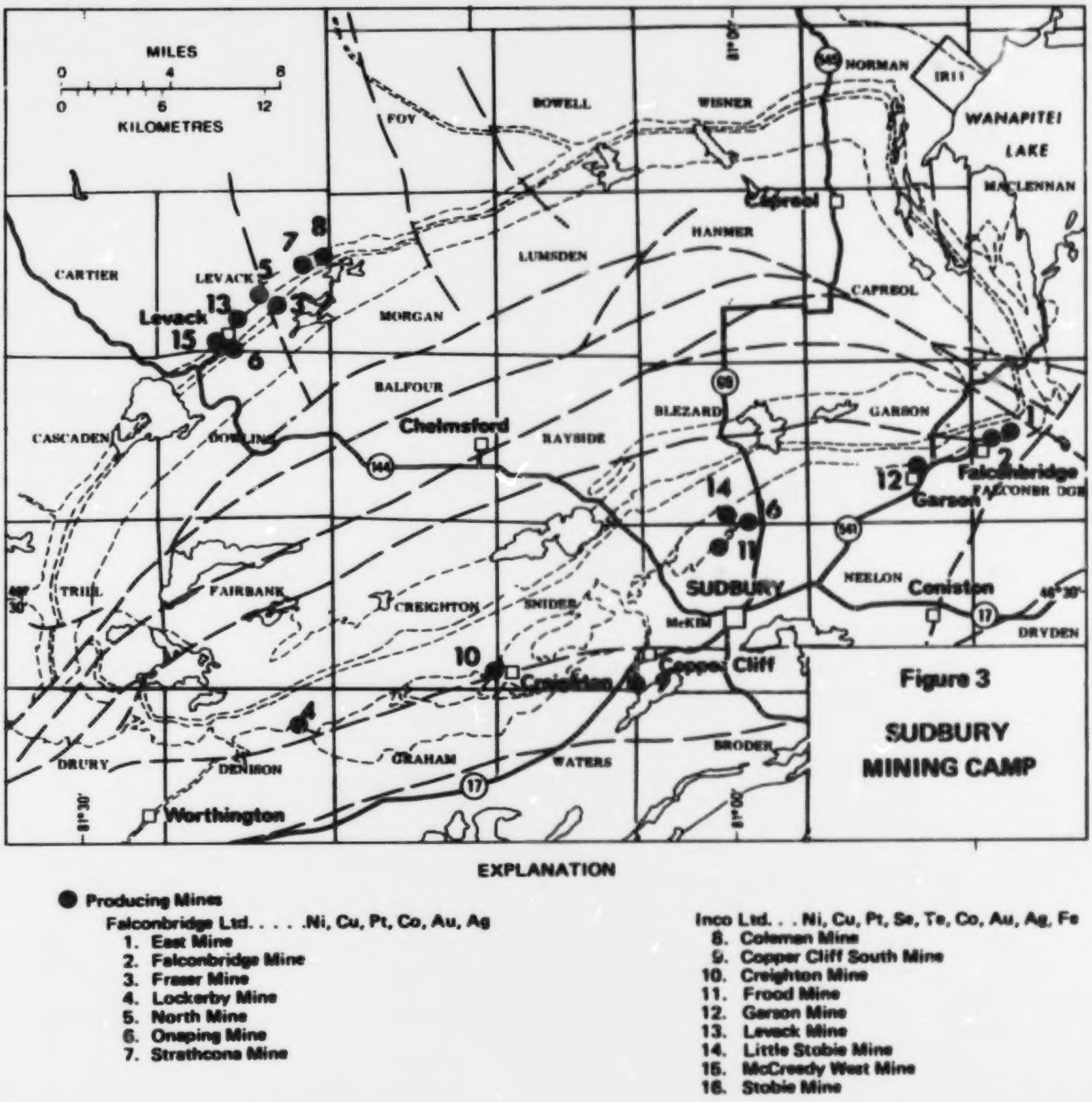

MILES
0
4
8
0
6
12
KILOMETRES
FOY
BOWELL
WISNER
NORMAN
WANAPITEI LAKE
MACLENNAN
Capreol
HANMER
LUMSDEN
CARTIER
LEVACK
Levack
MORGAN
CAPREOL
BALFOUR
BLEZARD
GARSON
CASCADEN
DOWLING
Chelmsford
RAYSIDE
144
69
Falconbridge
FALCONBRIDGE
Garson
541
TRILL
FAIRBANK
CREIGHTON
SNIDER
SUDBURY
NEELON
Coniston
46°30'
DRYDEN
McKIM
Copper Cliff
Creighton
BRODER
DRURY
DENISON
GRAHAM
WATERS
17
Worthington
81°30'
81°00'
1
2
3
4
5
6
7
8
10
11
12
13
14
15
16

Figure 3

SUDBURY MINING CAMP

EXPLANATION

● **Producing Mines**

Falconbridge Ltd. . . . .Ni, Cu, Pt, Co, Au, Ag

1. East Mine
2. Falconbridge Mine
3. Fraser Mine
4. Lockerby Mine
5. North Mine
6. Onaping Mine
7. Strathcona Mine

Inco Ltd. . . Ni, Cu, Pt, Se, Te, Co, Au, Ag, Fe

8. Coleman Mine
9. Copper Cliff South Mine
10. Creighton Mine
11. Frood Mine
12. Garson Mine
13. Levack Mine
14. Little Stobie Mine
15. McCreedy West Mine
16. Stobie Mine

## Nickel-Copper-Precious Metals

Inco Limited and Falconbridge Limited continue to be affected by the depressed nickel market, and both companies are operating at about 60% capacity. Figure 3 shows the producing mines in the Sudbury area during 1983. Low demand in the coins market forced staff reductions at Inco Limited's Sudbury based Canadian Alloys rolling mill which produces coinage strip and blanks.

In February, Inco Limited's Copper Cliff North Mine was reactivated after a 5-year closure due to uneconomical conditions. The mine is being developed as a full-scale research facility, the earlier blast hole method of mining being replaced by vertical retreat techniques which will improve productivity. Production is slated to begin in early 1984. Some limited production took place at the nearby Clarabelle No. 2 pit during 1983.

In April Inco Limited implemented a pyrrhotite rejection circuit at the Copper Cliff Mill to reduce sulphur dioxide emissions. The pyrrhotite is recovered in the floatation stage of processing and deposited in tailings ponds.

Late in the year a 10-year contract was signed by Inco Limited and the Talent Metal Corporation of Taiwan in which Inco Limited has acquired a 30% equity interest. Inco Limited will supply the sole feedstock for the Taiwanese facility which will produce utility nickel pig for the stainless steel, and nickel sulphate industries. The first order for delivery, by 1986, is for 10 000 metric tons of nickel oxide .

## Uranium

Kerr Addison Mines Limited's wholly owned subsidiary, Agnew Lake Mines Limited, phased out its uranium salvage leaching operation near Espanola early in the year. Declining solution grades and weak uranium prices were cited as factors in the shutdown. The company has been recovering uranium by heap leaching process since early 1980 when mining activities on the property were terminated.

## Gold

Westfield Minerals Limited has acquired, and is presently installing, a 200 ton-per-day mill on its Scadding Township property. Westfield Minerals Limited took over the gold property from its associate, Northgate Exploration Limited, earlier this year. Open pit operations are expected to begin in the near future with an initial recovery of 30 000 tons of surface ore over 7 to 8 months. The gold mineralization is concentrated in brecciated quartzite of the Serpent Formation.

## Industrial Minerals

Indusmin Limited continued production of silica from the company's quarry on Badgeley Island in Georgian Bay. The product is used in the manufacture of glass, and in the steel industry. During 1983, drilling was carried out on a previously untested quartzite body on Frazer Point.

Manitoulin Dolomite Limited continued production of dolostone from their quarry at the western end of Manitoulin Island. Crushed dolomite is transported by water to southwestern Ontario for use as aggregate.

Warren Industrial Feldspar Company Limited is conducting research into several quartzite properties in the Resident's area, and in October shipped a few thousand tons of quartz from a quarry in Foster Township. The company conducted bulk sampling of a silica deposit in Secord Township.

E. Taillefer shipped 10 loads of brecciated Gowganda Formation from his Aylmer Township quarry for use as decorative stone.

Black anorthosite was quarried in Dana Township and small amounts shipped to the United States for use as decorative stone. Sand and gravel were produced from numerous quarries in the vicinity of Sudbury and North Bay.

In October, 29 000 litres of crude oil were shipped from the Manitowaning area of eastern Manitoulin Island to Imperial Oil Limited in Sarnia. Oil production previously occurred between the late 1800s and the 1940s, but the petroleum industry has been dormant since then. The area is at the tip of the petroleum-bearing Michigan Basin and the crude is described as being of excellent quality.

## Ontario Geological Survey Activities

Publications released in 1983 by the Ontario Geological Survey that pertain to this area are listed in Table 1.

The Engineering and Terrain Geology Section of the Ontario Geological Survey continued a drilling program on Manitoulin Island to assess the petroleum potential of Paleozoic black shales in Ontario (*see* A, Figure 1).

Staff of the Aggregate Assessment Office of the Engineering and Terrain Geology Section carried out an aggregate resources inventory program in the Espanola area (*see* B, Figure 1).

J.A.C. Fortescue of the Geophysics and Geochemistry Section undertook a study of acid lakes in the area north of Lake Wanapitei (*see* C, Figure 1).

D.G.F. Long and T.R. Lloyd of Laurentian University worked with the Ontario Geological Survey in a joint project to assess the placer gold potential of basal Huronian strata of the Elliot Lake Group in the Sudbury area (*see* D, Figure 1).

J.M. Martins of the Sudbury Resident Geologist's Office mapped Snider Township at a scale of 1:15 840 with support from the Precambrian Section of the Ontario Geological Survey (*see* E, Figure 1).

## Exploration Activities

The general level of exploration activity in the area increased in 1983 compared with 1982. The total number of claims recorded to December 15, 1983 was 1222; Figure 4 summarizes staking activity for the past 11 years as recorded in the Sudbury Mining Recorder's Office.

Apart from normal development work carried out by the nickel producers of the Sudbury area, most exploration was centred on the search for, and evaluation of, gold deposits in the Huronian Supergroup of the Southern Province.

The joint venture team of Flag Resources Limited and Golden Briar Mines Limited resumed its exploration drilling program in Mackelcan Township with encouraging results. Three gold-bearing structures have been outlined, the original discovery site at Wolf Lake, and 2 more to the south at Jess and Jones Lakes. Grid drilling on 50 foot spacings will start in January. The Jess Lake zone will be the site of stripping and bulk sampling to assess the gold grade. The gold-bearing structures occur within brecciated quartzites of the Lorrain Formation.

Haultain Resources Limited undertook geophysical and diamond drilling programs on the Alwyn-Porcupine Gold Mine property in Scadding Township. The shaft was dewatered and a possible faulted extension of the main vein was located 1000 feet to the east. Results of the drilling are encouraging with gold present in all samples assayed. Haultain Resources Limited has also acquired a working interest in a program to recover gold from mill tailings on the former Long Lake Mine property in Eden Township, southwest of Sudbury.

New Arcadia Exploration Limited commenced a drilling program on a 26-claim group south of the Westfield Minerals Limited property in Scadding Township. Gold was encountered in an earlier drilling program associated with shear zones. An additional 28 claims have been acquired in adjacent Street Township and drilling is expected to begin in early 1984. Ateba Mines Incorporated carried out geological, magnetometer, and VLF-EM surveys in the same general vicinity of Scadding and Street Townships. Magnetometer and electromagnetic surveys were also carried out by Erana Mines Limited in the Scadding Township gold area.

In the same township, 3 diamond-drill holes were put down by J. Lee, and trenching operations were undertaken by A. Laaksonen and R. Butler.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS REGIONAL GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

Open File Reports

5386
5439
5458
5459
5460
5477
5383

Preliminary Maps - Geological Series

P.2591
P.2599
P.2600
P.2601
P.2602
P.2603

Preliminary Maps - Data Series

GDIF 7 - 7 inclusive
GDIF 62 - 73
GDIF 96 - 110
GDIF 112

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

Northern Ontario Engineering Geology Terrain Studies Report

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

MP 77
MP 107
MP 108
MP 110
MP 113
MP 114
MP 116

Miscellaneous Reports

GB 6

Geological Survey of Canada Open File Reports

TABLE 2 EXPLORATION ACTIVITY DURING THE YEAR.

The following is a list of companies and individuals known to have conducted exploration work within the Sudbury Resident Geologist's district in 1983, exclusive of exploration work for nickel deposits related to the Sudbury Igneous Complex. Previously unreported work from 1981 and 1982 is included. The numbers correspond to the numbered areas on Figures 1 and 2.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Bradvan Mining | Magnetometer, EM survey, gold prospect, Davis Township |
| 2 | Brady, J. | Trenching, gold prospect, Davis Township |
| 3 | Brady, J. | Trenching, gold prospect, Parkin Township |
| 4 | Canadian Nickel Company Ltd. | Geological survey, gold prospect, Davis Township |
| 5 | Canadian Occidental Petroleum Ltd. | Trenching and sampling, gold prospect, Davis Township |
| 6 | Canadian Occidental Petroleum Ltd. | Airborne EM and magnetometer surveys, Mackelcan and Aylmer Townships |
| 7 | F. C. Charlton | Geological survey, gold prospect, Maclennan Township |
| 8 | Consolidated Professor Mines Ltd. | Airborne EM and magnetomer surveys, Mackelcan Township |
| 9 | Cowaching Mines Ltd. | Drilling, gold prospect, Maclennan Township |
| 10 | Crossan, P. | Trenching, Olinyk Township |
| 11 | Erana Mines Ltd. | Magnetometer and EM surveys, gold prospect, Scadding Township |
| 12 | Flag Resources Ltd. and Golden Briar Mines Ltd. | Drilling, gold prospect, Mackelcan Township |
| 13 | Green, R. | Drilling and trenching, Eden Township |
| 14 | Haultain Resources Ltd. | Drilling and geophysical survey, gold prospect Scadding Township |
| 15 | Highland Crow Resources Ltd. | Drilling and geophysical survey, gold prospect, Afton Township |
| 16 | Indusmin Ltd. | Drilling, silica prospect, Killarney and Rutherford Townships |
| 17 | Jaatinen, I. | Trenching, Norman and Wisner Townships |
| 18 | James, L. S. and S. | Trenching, Roosevelt Township |
| 19 | Jasperson, J. K. | Trenching, Hess Township |
| 20 | Kidd Creek Mines Ltd. | EM and magnetometer surveys, base metal prospect, Hess Township |
| 21 | Laaksonen, A. and Butler, R. | Trenching, gold prospect, Scadding and Davis Townships |
| 22 | Leblanc, A. J. | Drilling, Henry Township |
| 23 | Lee, J. | Drilling, gold prospect, Scadding Township |
| 24 | Leschishin, E. and O. | Trenching, magnetometer and VLF-EM surveys, Davis Township |
| 25 | Leschishin, E. and O. | Trenching, Fraleck Township |
| 26 | Leschishin, E. and O. | Trenching, Parkin Township |
| 27 | Lynx-Canada Explorations Ltd. | Airborne EM and magnetometer surveys, McConnell Township |
| 28 | Nearctic Resources Ltd. | Drilling, gold prospect, Parkin Township |
| 29 | New Arcadia Exploration Ltd. | Drilling, gold prospect, Scadding Township |
| 30 | Sheppard, T. | Drilling, Mackelcan Township |
| 31 | Sulpetro Minerals Ltd. | Drilling, tungsten prospect, Foster Township |
| 32 | Viitala, R. L. | VLF-EM survey, gold prospect, Rathbun Township |
| 33 | Warren Industrial Feldspar Company Ltd. | Sampling, silica prospect,Secord Township |
| 34 | Willroy Mines Ltd. | Airborne EM and magnetometer surveys, Hutton Township |

E. Leschishin carried out magnetometer and VLF-EM surveys of 2 gold showings in Davis Township, and trenching and geological surveys in Fraleck and Parkin Townships. Other gold showings in Davis and Parkin Townships were trenched and sampled by J. Brady.

Highland-Crow Resources Limited and Copperfields Mining Corporation share a joint gold venture in Afton Township, northeast of Sudbury. A drilling program at the Golden Rose Mine past producer has confirmed 2 gold-bearing horizons, a low-grade shallow zone which could be reached by surface operations, and a deeper series of zones not related to previous production at the mine. The gold is in quartz veins associated with iron formation. A geophysical survey over the target area indicates that the favourable sulphide horizons continue over 1600 feet of strike. Surface and possible underground exploration will continue.

Other exploration efforts directed towards gold mineralization include a drilling program by Cowaching Mines Limited on their Maclennan Township prospect, and a similar program by Nearctic Resources Incorporated on a gold-base metal property in Parkin Township. The Howrey Creek gold belt southeast of Espanola has seen a renewal of interest, and an area around the eastern end of Lake Penage including Bevin, Sale, Caen, Dieppe, Goschen, and Stalin Townships has become a target of a flurry of staking activity. In Rathbun Township, R. Viitala carried out a magnetometer survey over a gold prospect immediately south of the Mondoux Mine showing.

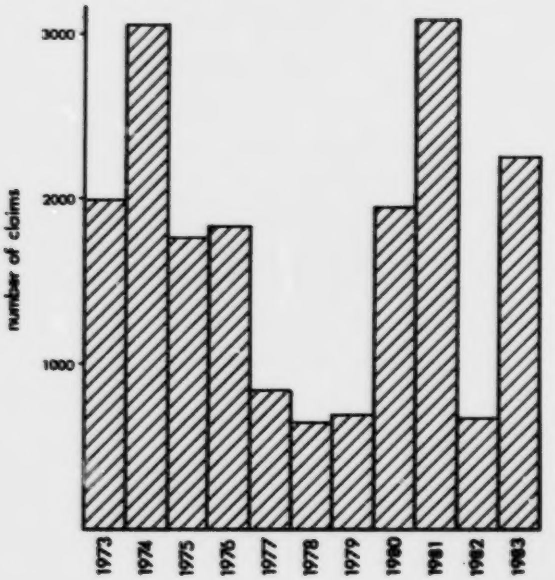


**Figure 4 — Claim Staking Activity, Sudbury Mining Recorder's Office.**

Commodities other than gold also experienced an increased level of exploration interest in 1983. Sulpetro Minerals Limited, after extending 2 holes and putting down 9 new ones, has completed more than 3000 feet of drilling on the Fostung joint venture at Espanola. Work is continuing with the objective of extending known tungsten mineralization.

In Hess Township Kidd Creek Mines Limited carried out electromagnetic and magnetic surveys on a property located near the former Geneva Lake (base metals) Mine.

Interest in graphite occurrences in the Algonquin Region of the Ontario Ministry of Natural Resources (*see* Huntsville Resident Geologist's Area, this volume) has spilled over into the Northeastern Region. Several claims have been recently staked in South Himsworth Township.

## Other Activities

The Sudbury Resident Geologist's Office and the Sudbury Mining Recorder's Office are providing work space for 6 people working with the Sudbury-Timmins-Algoma Mineral Program (STAMP). The program was developed and sponsored by Laurentian University, and funded by the Federal Government through the Geological Survey of Canada. Objectives include a mineral inventory to update the CANMINDEX database; a sampling program in the upper Huronian Supergroup to assess paleoplacer gold potential; studies within the Sudbury Basin; and a glacial till survey in the Timmins area.

A joint Federal-Provincial Mining Sector Work Program was announced in the fall of 1983. Known as MEP (Mineral Exploration Program), its objective is to provide financial assistance to individuals and companies wishing to undertake mineral exploration in an area northeast of Lake Wanapitei towards the Quebec border.

## Some Recent Publications and Theses

Allen, C.C., Gooding, J.L., and Keil, K.
1982: Hydrothermally Altered Impact Melt Rock and Breccia: Contributions to the Soil of Mars; Journal of Geophysical Research, Volume 87, p.10, 083-10, 101.

Cochrane, L.B.
1983: The Creighton Fault; Unpublished report prepared for Science North, Sudbury, Ontario, 51p.

Finn, G.C.
1981: Petrogenesis of the Wanapitei Gabbronorite Intrusion, a Nipissing-type Diabase from Northeastern Ontario; Unpublished M.Sc. Thesis, University of Western Ontario, 213p.

**TABLE 3**

**ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.**

SUDBURY REGION

AEM - Airborne Electromagnetic Survey
A Mag - Airborne Magnetometer Survey
DDH - Diamond - Drill
EM - Electromagnetic Survey
Geochem - Geochemical Survey
GL - Geological Survey
HLEM - Horizontal Electromagnetic Survey

IP - Induced Polarization Survey
Mag - Magnetometer Survey
Rad - Radiometric System
SA - Sampling, Assays
Tr - Trenching
STr - Soil Trenching
VLF - Very Low Frequency

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Aylmer, Mackelcan | 41 I/15 | Canadian Occidental Petroleum Limited | | Assess | A EM,A Mag | 1981 | 2.4833 | |
| Baldwin | 41 I/5 | Owen, James | | Assess | Tr,STr | 1982 | | |
| Bevin, Sale | 41 I/3 | Sulpetro Minerals Limited | | Assess | HLEM,Mag,VLF | 1982 | 2.4989 | |
| Curtin | 41 I/4 | Elliot, A. J. | | Assess | VLF,SA,SP | 1980 | 2.0376 | |
| | 41 I/4 | Elliot, A. J. | | Assess | SP | 1982 | | |
| Davis | 41 I/10 | Bradvan Mining | Au | Assess | Mag | 1982 | 2.5089 | |
| | 41 I/10 | Bradvan Mining | | Assess | EM,Mag | 1982 | 2.4927 | |
| | 41 I/10 | Bradvan Mining | | Assess | Mag | 1982 | 2.4996 | |
| | 41 I/10 | Brady, J. | | Assess | Tr,STr | 1983 | | |
| | 41 I/10 | Brady, J,Brady,M. | | Assess | Tr | 1983 | | |
| | 41 I/10 | Brady, M. | | Assess | Tr | 1983 | | |
| | 41 I/10 | Canadian Nickel Company Limited | | Assess | GL | 1983 | 2.5058 | |
| | 41 I/10 | Canadian Occidental Petroleum Limited | | Assess | TR,SA | 1983 | 2.5354 | |
| | 41 I/10 | Leschishin, E. | | Assess | STR,Tr | 1983 | | |
| | 41 I/10 | Silverside Resources Inc. | | Assess | Geochem | 1981 | 2.4354 | |
| Eden | 41 I/6 | Du Pont of Canada Exploration Ltd. | Au | Assess | GL | 1981 | 2.4826 | |
| | 41 I/6 | Du Pont of Canada Exploration Ltd. | | Assess | Mag | 1982 | 2.5006 | |
| | 41 I/6 | Du Pont of Canada Exploration Ltd. | | Assess | IP,Res | 1982 | 2.5125 | |
| | 41 I/6 | Du Pont of Canada Exploration Ltd. | Au | Assess | DDH 2-700' | 1982 | | |
| | 41 I/6 | Du Pont of Canada Exploration Ltd. | base metals | Assess | Mag | 1982 | 2.5001 | |
| | 41 I/6 | Du Pont of Canada Exploration Ltd. | | Assess | GL | 1982 | 2.4556 | |
| | 41 I/6 | Luke Lake Limited | | Assess | Geoch. | 1981 | | |
| | 41 I/6 | Luke Lake Limited | Ni,Cu,Au | Assess | GL | 1982 | 2.5309 | |
| Ermatinger | 41 I/12 | Green, R. | | Assess | Tr,STr,<br>DDH 2-162' | 1982 | | |
| Foster | 41 I/4 | Canadian Nickel Company Limited | Au | Assess | GL | 1982 | | |
| | 41 I/4 | Sulpetro Minerals Minerals Limited | Ag,Au,Cu<br>Mo,Wo | Assess | DDH 3-2263' | 1980,<br>1981 | | |
| Fraleck | 41 I/15 | Leschishin, O. | | Assess | Tr,STr | 1983 | | |
| Henry | 41 I/9 | Leblanc, A. J. | | Assess | DDH 1-106' | 1983 | | |
| Hess | 41 I/12 | Jasperson, J. K. | | Assess | Geochem | 1981 | | |
| | 41 I/12 | Jasperson, J. K. | | Assess | SP | 1982 | 2.4379 | |
| | 41 I/12 | Jasperson, J. K. | | Assess | STr | 1982 | | |

TABLE 3 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Hess | 41 I/12 | Kidd Creek Mines Limited | | Assess | EM,Mag | 1983 | 2.5588 | |
| Hutton | 41 I/14 | Maki, O. T. | Au,Ag | Assess | Geochem,Tr | 1982 | 2.5044 | |
| | 41 I/14 | Roy, A. | | Assess | Tr,STr | 1982 | | |
| | 41 I/14 | Willroy Mines Ltd. | | Assess | A EM,Mag | 1982 | 2.5205 | |
| Killarney, Rutherford | 41 I/3 | Indusmin Limited | | Assess | DDH 7-2431' | 1983 | | |
| Mackelcan, Aylmer | 41 I/15 | Canadian Occidental Petroleum Ltd. | | Assess | A EM,Mag | 1981 | 2.4553 | |
| Mackelcan, McConnell | 41 I/15 | Dejour Mines Limited | | Assess | A EM,Mag | 1981 | 2.4508 | |
| Mackelcan | 41 I/15 | Canadian Occidental Petroleum Ltd. Limited | | Assess | A EM,Mag | 1981 | 2.4513,<br>2.4514 | |
| | 41 I/15 | Consolidated Professor Mines Limited | | Assess | A EM,Mag | 1981 | 2.4557 | |
| Maclennan | 41 I/10 | Charlton, F. C. | | Assess | GL | 1981 | 2.4487 | |
| | 41 I/10 | Charlton, F. C. | Au | Assay | SA | 1981 | 2.5060 | |
| | 41 I/10 | Sheppard, T. | | Assess | DDH 4-247.5' | 1983 | | |
| | 41 I/10 | Sheppard, T. | | Assess | SA,GL,Tr | 1981 | 2.4573 | |
| | 41 /10 | Shepparu, T. | | Assess | Dewatering | 1982 | 2.5063 | |
| McConnell | 41 I/15 | Lynx-Canada Explorations Limited | | Assess | A EM,Mag | 1981 | 2.4660 | |
| Merritt | 41 I/4 | Canadian Nickel Company Limited | | Assess | SA | 1981 | 2.5430 | |
| Morgan | 41 I/11 | Falconbridge Limited | Ni,Cu | Assess | GL | 1982 | 2.4911 | |
| Nairn | 41 I/5 | Crick, E. J. | | Assess | DDH 4-420' | 1982 | | |
| Norman, Wisner | 41 I/15 | Jaatinen, I. | | Assess | Tr | 1982 | | |
| Olinyk | 41 J/16 | Crossan, P. | | Assess | Tr | 1982 | | |
| Parkin | 41 I/15 | Leschishin, O. | | Assess | STr,Tr | 1983 | | |
| Rathbun | 41 I/15 | Canadian Nickel Company Limited | | Assess | GL | 1982 | 2.5487 | |
| | 41 I/15 | Canadian Nickel Company Limited | | Assess | A EM,Mag,Rad | 1981 | 2.4635 | |
| | 41 I/15 | Floron Enterprises Limited | Ni,Cu,Pt | Assess | STr | 1982 | | |
| | 41 I/15 | Viitala, R. L. | Au | Assess | Geoch | 1981 | 2.4565 | |
| | 41 I/15 | Viitala, R. L. | Au | Assess | GL,SA | 1982 | 2.5043 | |
| | 41 I/15 | Viitala, R. L. | | Assess | GL | 1982 | 2.5686 | |
| | 41 I/15 | Viitala, R. L. | | Assess | VLF EM | 1983 | 2.5443 | |
| Rathbun, Mackelcan | 41 I/15 | Flag Oils Limited | | Assess | A EM,Mag | 1981 | 2.4512 | |
| Roberts | 41 I/14 | Karvinen, W. O. | $U_3O_8$ | Assess | SA | 1981 | 2.4984 | |
| | 41 I/14 | Karvinen, W. O. | | Assess | DDH 2-475' | 1982 | | |
| Roosevelt | 41 I/4 | James,L.S.,James,S | | Assess | Tr,STr | 1982 | | |
| Scadding | 41 I/10 | Arcadia Explorations Limited | | Assess | DDH 7-2287' | 1983 | | |
| | 41 I/10 | Northgate Exploration Limited | | Assess | G,EM,Mag | 1981 | 2.4211 | |
| | 41 I/10 | Sansone, R.<br>Watt, D. R.<br>McLean, P. C. | Au | Assess | GL,Geochem | 1981 | 2.5032 | |
| Scadding, Street | 41 I/10 | Ateba Mines Inc. | | Assess | A EM,Mag | 1981 | 2.4233 | |
| Shakespeare | 41 I/5 | Blue, P. G. | Au,U | Assess | Tr,SA | 1982 | 2.4582 | |

Franklin, J.M., Roscoe, S.M., Loveridge, W.D., and Sangster, D.F.
1983: Lead Isotope Studies in Superior and Southern Provinces; Geological Survey of Canada, Bulletin 351, 60p.

Hattori, K., Campbell, F.A., and Krouse, H.R.
1983: Sulphur Isotope Abundances in Aphebian Clastic Rocks: Implications for the Coeval Atmosphere; Nature, Volume 302, p.323.

Holst, T.B.
1982: Regional Jointing in the Northern Michigan Basin; Geology, Volume 10, p.273-277.

James, R.S., Born, P., and Bigauskas, J.
1983: Geology of the East Bull Lake Layered Complex, District of Algoma, Ontario; p.1-11 *in* Current Research, Part B, Geological Survey of Canada, Paper 83-1B.

McCrank, G.F.D., Stone, D., Kamineni, D.C., Zayachkivsky, B., and Vincent, G.
1983: Regional Geology of the East Bull Lake Area, Ontario; p.457-464 *in* Current Research, Part A, Geological Survey of Canada, Paper 83-1A.

Naldrett, A.J., Innes, D.G., Sowa, J., and Gorton, M.P.
1982: Compositional Variations Within and Between Five Sudbury Ore Types; Economic Geology, Volume 77, p.1519-1534.

Sims, P.K., Card, K.D., and Lumbers, S.B.
1981: Evolution of Early Proterozoic Basins of The Great Lakes Region; p.379-397 *in* Proterozoic Basins of Canada, edited by F.H.A. Campbell, Geological Survey of Canada, Paper 81-10.

Stockwell, C.H.
1982: A Time Classification of Precambrian Rocks and Events; Geological Survey of Canada, Paper 80-19, 135p.

Young, D.A.
1982: Radioactive Conglomerates of the Agnew Lake Area, District of Sudbury, Ontario; Unpublished B.Sc. Thesis, Princeton University, 89p.

Young, G.M.
1982: Depositional Environments and Tectonic Setting of the Early Proterozoic Huronian Supergroup; Excursion 13B *in* Field Excursion Guidebook, Eleventh International Congress on Sedimentology, Hamilton, Ontario, August, 1982, 79p.

# Report of Activities 1983
# Huntsville Resident Geologist Area, Algonquin Region

**David J. Villard[1] and Mary Garland[2]**

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## Introduction

During 1983, industrial minerals and gold were again the focus of activity by the exploration companies and prospectors, as well as the Resident Geologist. Claim staking increased in 1983 due mainly to renewed interest in flake graphite, and some rekindled interest in gold. There was also some minor interest shown in base metals, silica, garnet, and building stone.

## Resident Geologist's Activities

The Algonquin Region, for mineral management purposes, is divided into 2 areas of responsibility. The Huntsville Resident Geologist is responsible for the northwestern half of the Region as shown on Figure 1.

Presently, staff in the Huntsville office include: William J. Logan, Mineral Resources Co-ordinator; David J. Villard, Resident Geologist; Martha Fabricius, Secretary; and Mary Garland, full-time contract Resource Geologist. Jill Van Luit worked on contract until May as an Aggregate Geologist. Ian Porter, an Experience '83 student, was employed during the summer to work on various projects.

As in previous years, much of the Resident Geologist's time was spent on consultative duties. Industrial minerals (mainly graphite), base metals, and gold were the main commodities for which information was requested. Selected mineral properties in the Region were visited during 1983 with emphasis placed on examining properties currently being explored, as well as on those associated with the Region's gold and graphite projects.

Jill Van Luit completed a detailed aggregate assessment of the District Municipality of Muskoka with the publication of an Open File Report (Staff of the Algonquin Region 1983). The information from this study will prove beneficial in providing input to the Municipality's planning process.

Mary Garland initiated a project to examine the graphite potential of the Algonquin Region. To date, the project has resulted in detailed mapping on a property with high potential and numerous visits to other properties and selected occurrences.

The evaluation of the gold potential of the Central Gneiss Belt continued. Field work concentrated on the inventory of known or suspected gold occurrences, with particular emphasis placed on those occurrences associated with graphite. It is intended to publish a summary of results to date by April of 1984.

A 1-day Prospector's Class was given jointly by Hans D. Meyn, Rick Keevil, and David J. Villard to Regional Ministry Staff interested in learning more about mineral exploration.

Several talks and field trips were given for various client groups including Junior Rangers, public schools, and Provincial Park visitors.

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[1] Resident Geologist, [2] Resource Geologist, Ontario Ministry of Natural Resources, Huntsville.

## Gold Project

A project to evaluate the gold potential of the Central Gneiss Belt was initiated in 1981 and has continued since then. To date, over 45 occurrences have been located, mapped, and sampled. Due to budget constraints, sampling was limited to a few samples per occurrence, decreasing the probability of detecting anomalous gold values. Another factor making study of the gold potential difficult is the sparseness of the geological database for this part of the Grenville Province.

Some of the results to date are interesting, but in general, most occurrences sampled show only background values for gold.

## Graphite Project

The Graphite Project was initiated to provide a field assessment of graphite occurrences catalogued by Martin (1983), and to yield some idea on the nature of graphite occurrences in the Central Gneiss Belt, as well as their size, grade, tonnage, and accessibility. Feasibility studies to assess the milling potential of graphite were also undertaken. The project commenced in May 1983, and will continue through 1984.

After 4 weeks of investigation of several reported graphite occurrences, it was found more advantageous to do detailed mapping over a few select occurrences in order to provide a better understanding of the parameters controlling graphite mineralization. The work included outcrop mapping — to delineate graphite zones within specific rock types; structural mapping. Geochemical and petrographic work on both graphitic and non-graphitic zones will be undertaken in the future.

Five graphite properties were selected for detailed examination; in Maria Township, Laurier Township, Butt Township, and 2 in Ryerson Township. These deposits are being, or already have been, considered for production.

Information presented in past reports on the graphite occurrences in Ryerson, Butt, and Maria Townships, indicate that graphite occurs in a series of metasediments ranging from granitic paragneiss to metapelite or quartzite. The graphitic zones can extend to over 3 km and vary in exposed width from <30 m to >300 m. True width is not known for most of the occurrences, and may vary significantly along strike. Accessory minerals occurring with graphite consist predominantly of biotite, garnet, and pyrite. The significance of the amounts or compositions of these minerals with respect to graphite flake size or distribution is not known.

Graphite occurs both as fine flakes (<4 mm) and coarse flakes (>4 mm), with fine flakes predominating in most of the occurrences. The graphite is developed throughout the host rock, preferentially along foliation planes and at the contact of mineral layers. Concentration of graphite varies between an average of 2 to 5% across strike in the occurrences, presenting a major problem in estimation of overall grade. In the Maria, Butt, and Ryerson Townships properties, sections of high-grade graphite, up to 10%, occur in discontinuous narrow lenses within the main graphite zone.

Graphite in the Laurier Township occurrence is associated with a fine grained, siliceous, dark green to grey rusty rock. The origin of the host rock could be either pelitic or volcanic. The graphite occurs as very fine grained disseminations throughout the rock, with concentrations associated with pyrite blebs and pyrite disseminated in fractures. The graphitic horizon is in contact with an anorthosite which has intrusively affected the width of the unit. Strike length is known to extend for about 1300 m and is open to the south. This deposit was originally prospected for gold in the early 1900s and there may be a possible gold association.

Future work by the Resident Geologist's staff will involve follow-up petrographic work on thin sections from the Laurier occurrence, and whole rock geochemistry. Detailed mapping on the Ryerson, Butt, and Maria Townships deposits will be done at a scale of 1:2500 over the graphitic horizons, with smaller scale mapping to tie the occurrence into the regional geology.

Petrographic and geochemical work will also be done on the Maria, Butt, and Ryerson graphite deposits in order to determine and delineate the rock-type hosting the graphite, and to investigate parameters controlling flake size, grade, and localization of the graphite. An attempt will be made to tie the graphitic horizons into the regional geology and structural trends in the Central Gneiss Belt.

# Other Geological Activities

## Ontario Geological Survey

M.J. Ford and R.S. Geddes, from the Engineering and Terrain Geology Section, completed detailed geological mapping of Quaternary deposits at a scale of 1:50 000 of Algonquin Provincial Park. The following NTS sheets or partial sheets were covered in 1983: 31 E/7 (all), 31 E/8 (all), 31 E/9 (all), 31 E/10 (all), 31 E/11 (partial), 31 E/16 (completed). Summaries of this work are presented in the Ontario Geological Survey "Summary of Field Work" Wood *et al.* (1983).

## Geological Survey of Canada

S. Hanmer carried out structural reconaissance mapping of the Central Gneiss Belt boundary in order to select areas for detailed mapping in 1984/1985.

## Royal Ontario Museum

S.B. Lumbers continued studies of the boundary between the Algonquin Batholith and the Grenville Supergroup and mapped in the Dorset-Huntsville area during 1983.

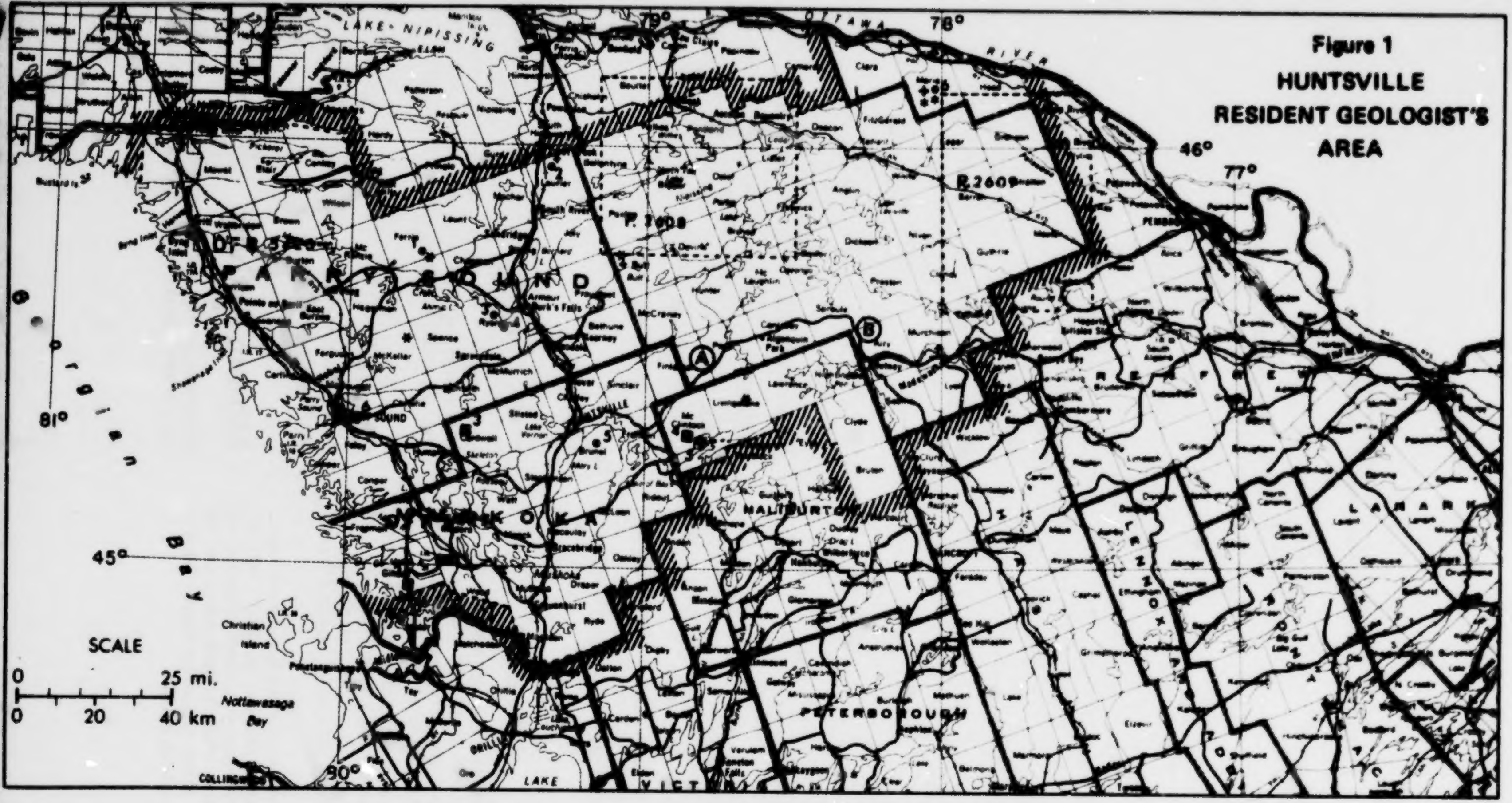
LAKE NIPISSING
OTTAWA RIVER
79°
78°
77°
46°
45°
81°
80°
P. 2608
P. 2609
A
B
PARRY SOUND
MUSKOKA
HALIBURTON
PETERBOROUGH
VICTORIA
RENFREW
LENNOX AND ADDINGTON
LANARK
Georgian Bay
Christian Island
Nottawasaga Bay
COLLINGWOOD
LAKE
SCALE
0
25 mi.
0
20
40 km

**Figure 1**
**HUNTSVILLE**
**RESIDENT GEOLOGIST'S**
**AREA**

**EXPLANATION**

■ Producing Quarries

1. Mill Lake Quarry . . . . . . . . . . . . . building stone
2. M.T.C. . . . . . . . . . . . . . construction aggregate
3. Cardwell Twp. . . . . . . . . . . . . . . building stone
4. L. Lock. . . . . . . . . . . . . . . . . . . building stone
5. O. Geldschus. . . . . . . . . . . . . . . building stone
6. Fowler Construction . . . . . . construction aggregate

Ⓐ Location of OGS Field Party, 1983

* Assessment Work Filed, 1983 (keyed to Table 1)

• Exploration Activity, 1983
(keyed to Table 2)

+ Claim staking, 1983

▨ Boundary of Resident Geologist's Area

═ Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 1)
P. —Preliminary Map
OFR—Open File Report

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

**Ontario Geological Survey Reports**

**Open File Reports**

OFR 5425
OFR 5457

**Preliminary Maps - Geological Series**

P. 2608
P. 2609

**Preliminary Maps - Data Series**

**Aggregate Resources Publications**

**Federal - Provincial Maps**

**Coloured Maps**

**Northern Ontario Engineering Geology Terrain Studies Reports**

**Northern Ontario Engineering Terrain Studies Maps**

**Mineral Resources Branch Publications**

**Miscellaneous Reports**

MP 107
MP 116

**Geological Survey of Canada Open File Reports**

# Exploration Activity

As of December 15, 1983, a total of 71 claims were staked in the area, a noticeable increase from the 11 staked in 1982. A significant proportion of the activity in 1983 was carried out on patented land.

Exploration activity (*see* Figure 1) was related to interests in graphite, gold, base metals, and silica. Table 2 summarizes the work carried out on specific properties in 1983.

## Graphite

Interest in graphite continued at a high level in 1983, with work being conducted on both existing and new properties. Activity was concentrated in the area north of Huntsville and in Maria Township, north of Pembroke.

Limited surface work and diamond drilling was carried out on properties in Ryerson and Laurier Townships. Limited surface work was also carried out in Maria Township. Several other occurrences scattered throughout the area were also evaluated.

Two graphite properties are currently being examined for the possible association of gold with graphite. One property in particular has returned good values (*confidential*, personal communication, 1983) for gold from rocks that are not characteristic of the "typical gneisses". More information should be available in 1984.

## Base Metals

Exploration for base metals was again concentrated in the Parry Sound-Rosseau area and in Ferrie Township. The work includes both reconnaissance exploration and a minor amount of detailed property examination. Limited diamond drilling on a copper-nickel property in the Huntsville area was undertaken.

## Gold

Exploration for gold was carried out on a minor scale throughout the area. Local prospectors in the Rosseau-Parry Sound area have been active, with some ground being acquired. As previously mentioned, several graphite properties have been checked for gold. One was originally explored for gold about 80 years ago.

## Quartz

Exploration for quartz continued but activity was of a reconnaissance nature.

# Mining Activity

Numerous quarries, most notably the Mill Lake Quarry at Parry Sound, produced flagstone for use primarily as a

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Jones, E. | Trenching, prospecting, Ferrie Township |
| 2 | Ackerley, G. | Trenching, diamond drilling, Laurier Township |
| 3 | Ackerley, G. | Diamond Drilling, bulk sampling, Ryerson Township |
| 4 | Blanchard, E. | Diamond Drilling, Ryerson Township |
| 5 | Irving, W. | Diamond Drilling, Brunel Township |
| 6 | Blanchard, E. | Trenching, Maria Township |

TABLE 3

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

Abbreviations Used:

Assess - Assessment Work
EM - Electromagnetic Survey
Mag - Magnetometer Survey
Rad - Radiometric Survey
Tr - Trenching
STr - Soil Trenching
VLF - Very Low Frequency

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Livingstone Twp.<br>Haliburton Co. | 31E/7 | William Irving | Gold | Assess | Tr | 1982 | – | LIVINGSTONE 3 |
| Maria Twp.<br>Renfrew Co. | 31L/1 | Edward Blanchard | Graphite | Assess | Tr<br>STr | 1982 | – | MARIA 1 |
| McKellar Twp.<br>Parry Sound Dist. | 31E/12 | Jack McVittie | Calcite | Assess | Rad<br>Mag | 1979 | – | McKELLAR 5 |
| Croft Twp.<br>Parry Sound Dist. | 31E/12 | Everett Jones | Copper | Assess | Tr<br>STr | 1983 | – | CROFT 1 |
| Maria Twp.<br>Renfrew Co. | 31L/1 | Edward Blanchard | Graphite | Assess | VLF<br>EM | 1982 | – | MARIA 2 |

With the publication of the Open File Report, "Industrial Minerals of the Algonquin Region" (Martin 1983), several industrial minerals should be considered for examination. These include graphite, silica, talc, building stone, and sillimanite, all of which have good to moderate potential in the Central Gneiss Belt.

The area trending northeast from Parry Sound is recommended as warranting further exploration for base and precious metals. Explorationists should also closely investigate the possible association of gold with graphite.

## References and Recent Publications

Culshaw, N.G., Davidson, A., and Nadeau, L.
1983: Structural Subdivisions of the Grenville Province in the Parry Sound-Algonquin Region, Ontario; p.243-252 *in* Current Research, Part B, Geological Survey of Canada, Paper 83-1B.

Lindia, F.M., Thomas, M.D., and Davidson, A.
1983: Geological Significance of Bouguer Gravity Anomalies in the Region of Parry Sound Domain, Grenville Province, Ontario; p.261-266 *in* Current Research, Part B, Geological Survey of Canada, Paper 83-1B.

Martin, Wendy
1983: Industrial Minerals of the Algonquin Region; Ontario Geological Survey, Open File Report 5425, 316p. Accompanied by Maps P.2562 to P.2567, scale 1:15 840 or 1 inch to ¼ mile.

Minnes, G.
1983: Ontario Industrial Minerals for Ontario in the 1980s; p.13-19 *in* 19th Forum on the Geology of Industrial Minerals, Proceedings, edited by S.E. Yundt, Ontario Geological Survey, Miscellaneous Paper 114, 216p.

Rogers, C.
1983: Search for Skid Resistant Aggregates in Ontario; p.185-205 *in* 19th Forum on the Geology of Industrial Minerals, Proceedings, edited by S.E. Yundt, Ontario Geological Survey, Miscellaneous Paper 114, 216p.

Scott, D.
1983: Structural Industrial Minerals in Ontario; p.20-32 *in* 19th Forum on the Geology of Industrial Minerals, Proceedings, edited by S.E. Yundt, Ontario Geological Survey, Miscellaneous Paper 114, 216p.

Springer, Janet S.
1983: Mineral Deposits Studies in the Grenville Province; p.263-265 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Springer, Janet S., and Vos, M.A.
1983: Industrial Minerals Program; p.386-291 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Staff of the Algonquin Region
1983: Aggregate Resources Assessment, District Municipality of Muskoka; Ontario Geological Survey, Open File Report 5457, 14p. and 12 maps.

Villard, David J.
1983: 1982 Report of the Huntsville Resident Geologist; p.163-168 *in* Report of Activities, Regional and Resident Geologists, 1982, edited by C.R. Kustra, Ontario Geiological Survey, Miscellaneous Paper 107, 211p.

White, O.L.
1983: Geology of Ontario; p.1-8 *in* 19th Forum on the Geology of Industrial Minerals, Proceedings, edited by S.E. Yundt, Ontario Geological Survey, Miscellaneous Paper 114, 216p.

Wood, John, White, Owen L., Barlow, R.B., and Colvine, A.C.
1983: Summary of Field Work, 1983, by the Ontario Geological Survey; Ontario Geological Survey, Miscellaneous Paper 116, 313p.

# Report of Activities 1983
# Bancroft Resident Geologist Area, Algonquin Region

**Hans D. Meyn**[1]

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1—Bancroft Resident Geologist's Area ........ 212

## Introduction

The Bancroft Resident Geologist's Office is responsible for the Minden, Bancroft, and Pembroke Districts, which are part of the Algonquin Region (*see* Figure 1).

The office is staffed by Hans D. Meyn, Resident Geologist, and Karen Fell, secretary. Patricia Flagler, summer student, assisted in the office and field for several weeks.

As with economic activity in the country as a whole, exploration activity in the area was limited. The operating mines were not at full capacity.

The Core Storage Library, which will expand service to the mining community, is now under construction in the Bancroft District Yard of the Ontario Ministry of Natural Resources and is scheduled for completion by the end of the fiscal year (March 31, 1984).

## Resident Geologist's Activities

The Resident Geologist continued to devote considerable time to familiarization with the geology and mineral deposits of the area. Several known, currently inactive, mineral occurrences were visited, and new properties undergoing exploration were visited in the company of the owner or operator. The operating mines were also visited.

A program to locate and reanalyze the known gold and silver occurrences in the Resident Geologist's area was commenced and about half, mostly those occurrences south of Bancroft, were visited. Preliminary results indicate that gold and silver are present in anomalous amounts but commonly not up to commercial grade, and tonnages seem to be limited.

Several inactive properties, mostly old iron mines, were visited as part of the Ministry's program to safeguard dangerous mine workings. Several claims reverting to the Crown were also inspected for dangerous workings.

The Resident Geologist also participated in several fieldtrips, most of them given by persons doing geological work in the area either for the provincial or federal governments or a university.

Mineral collecting (rockhounding) is an important part of the Bancroft area economy and the Resident Geologist was involved with the Chamber of Commerce and the Ontario Ministry of Citizenship and Culture in an effort to support (sustain) mineral collecting in the Bancroft area.

As part of that effort, the Ontario Ministry of Natural Resources, Algonquin Region, again this year, sponsored a booth at the Bancroft Gemboree and the Wilberforce Rockhound Fair, at which mineral and geologically oriented publications issued by the Ministry were on sale. As in previous years, D.H. Gorman, Professor of Mineralogy, University of Toronto, identified rocks and minerals for the rockhounds.

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[1] Resident Geologist, Ontario Ministry of Natural Resources, Bancroft.

TABLE 1 | MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

Ontario Geological Survey Reports

GR 212
GR 230

Open File Reports

OFR 5333
OFR 5425
OFR 5428
OFR 5448
OFR 5449
OFR 5152
OFR 5462
OFR 5474

Preliminary Maps - Geological Series

P.2536
P.2591
P.2596
P.2597
P.2598
P.2614

Preliminary Maps - Data Series

GDIF 56
GDIF 57
GDIF 58
GDIF 59
GDIF 60
GDIF 61

Aggregate Resources Publications

Federal - Provincial Maps

Coloured Maps

2459
2460
2461
2462
2475

Northern Ontario Engineering Geology Terrain Studies Reports

Northern Ontario Engineering Terrain Studies Maps

Mineral Resources Branch Publications

MPBP 16, Making the Most of Our Minerals.
Video Census Series No.2

Miscellaneous Reports

MP 107, 108, 111, 113, 114, 115, 116
Rocks and Minerals Information,1983 - Booklet
When Time is Old - Booklet

# Other Geological Activities

## Algonquin Region, Ontario Ministry of Natural Resources

The northern part of the Algonquin Region is the responsibility of D.J. Villard, Resident Geologist, Huntsville (*see* Report of the Huntsville Resident Geologist, this volume).

### Leslie M. Frost Natural Resources Centre

J. Stocking, Lands and Minerals Specialist, returned to the Frost Centre in September after a 14-month secondment to the Ontario Geological Survey on the peat inventory program. R. Keevil was appointed acting Lands and Minerals Specialist during the former's absence; J. Etches is currently Mineral Resource Assistant.

The Frost Centre had another excellent year. A group of about 60 students from Sir Sanford Fleming College, Lindsay, did geological and geophysical field work on the training claim for about a week. J. Van Luit completed the aggregate resource assessment of the Frost Centre property (private report for the Frost Centre). About 6000 visitors availed themselves of tours and lectures in the mineral resource field. The centre acquired a large polishing lap so that larger polished samples can be produced. R. Keevil also presented lectures at 3 Junior Ranger Camps and devoted some time to the Dorset Seniors with mineral collecting and lapidary sessions. Also, a one-day prospecting class was given to Regional Lands and Waters staff during the summer, and the Frost Centre Minerals Program was audited by the Regional Mines Co-ordinator during October and November.

## Ontario Geological Survey

Maps and reports pertaining to the Bancroft Resident Geologist's area issued by the Ontario Geological Survey are shown on Figure 1 and listed in Table 1. Additional references to new information of geological interest in the general area are included in the list of selected references. Also shown on Figure 1 is the location of 1983 field work (field parties) of the Ontario Geological Survey.

### Precambrian Section

A field party under the leadership of R. Thivierge was mapping and checking in support of producing a compilation map for the area north and northeast of Bancroft (Thivierge 1983).

A field party under the leadership of M. Easton commenced detailed mapping (1:15 840) of the Howland area. This is the beginning of a detailed mapping project to delineate the alkaline and nepheline-bearing rocks of the Algonquin Region between Minden and the Ottawa River (Easton 1983).

### Mineral Deposits Section

J.S. Springer continued studies of metallic and industrial minerals in the Grenville Province. No field work was undertaken in the Algonquin Region in 1983 (Springer 1983).

### Engineering and Terrain Geology Section

M.J. Ford and R.S. Geddes continued mapping the Quaternary geology of Algonquin Park (Ford 1983; Geddes 1983).

D.J. Russell continued study of the Paleozoic outliers on the Canadian Shield. This included some field work in Renfrew County (Russell 1983).

D.A. Williams continued study of the Paleozoic geology of the Ottawa-St. Lawrence Lowland, Southern Ontario (Williams and Rae 1983).

J.L. Riley, as part of a continuing investigation of the peat resources of Ontario, published laboratory analyses of peat samples (Riley 1983a, 1983b).

## Geological Survey of Canada

S. Hanmer did spot mapping and reconnaissance traversing for structural studies in the Grenville Province and to delineate field areas for the 1984 field season. Detailed mapping in selected areas will follow in 1984.

C. Kaszycki, as part of a doctorate thesis at the University of Illinois, was completing mapping of the Quaternary geology of (1:50 000) NTS sheets 31 D/15 (Minden), 31 D/16 (Gooderham), 31 E/1 (Wilberforce), and 31 E/2 (Haliburton).

W.W. Shilts continued work on the sensitivity of surface sediments to the effects of acid precipitation; and study of the geology of lake basins by sonar survey also continued.

H.E. Dunsmore commenced a project to study metallogenic processes in sedimentary-diagenetic environments.

P. Killeen continued a borehole geophysics study including some work in the Bancroft area.

P. Holman supervised an airborne gamma-ray spectrometer survey of the Haliburton area.

J.M. Larose collected samples in the Bancroft area for preparation of mineral sets sold by the Federal Government. R.K. Herd of the National Museum did collecting in the area as well, and A.P. Stenson studied the mineral occurrences west of Bancroft.

## Royal Ontario Museum

S.B. Lumbers continued a study of the boundary between the Algonquin Batholith and the Grenville Supergroup, mapping in the Haliburton-Huntsville area.

## Universities

C. Pride, University of Ottawa, is continuing his study of the geochemical evolution of the Glamorgan Migmatite Complex.

R. Thivierge, University of Ottawa, is doing a M.Sc. Thesis on the Centreville-Combermere area.

L.M. Heaman, McMaster University, Hamilton, is completing a thesis on the isotopic and trace elements study in the Chandos Township area (Heaman *et al.* 1982).

Allison Beales, University of Waterloo, commenced a thesis on scapolites in Dungannon Township.

The University of Windsor conducts an annual field camp in Limerick Township and some work on this area is being done by professors and their students.

Dennis V. Woods, Queen's University, Kingston, is investigating the Paleozoic-Precambrian unconformity of Eastern Ontario by seismic reflection.

D.W. Dalrymple, Queen's University, Kingston, is studying the sedimentology of Cambro-Ordovician sandstones of Eastern Ontario.

U. Brand and J. Terasmae, Brock University, St. Catherines, commenced a study on the source rock geochemistry of Pleistocene tills of Southern Ontario with emphasis on the origin of the Dummer moraine (Brand and Terasmae 1983).

J.W. Card and K. Bell, Carleton University, Ottawa, continued a study of latter-stage decay products of $^{222}$Rn and their use in radioactive waste management (Card and Bell 1983b).

## Exploration Activity

Certain sections of the economy have recovered somewhat from the worst of the recent recession, but mining company activity and exploration budgets are still below that of the late 1970s.

The location of properties on which exploration is known to have been done in 1983 are listed in Table 2, and shown on Figure 1, keyed to Table 2. Assessment work reports and other claim-related information received in this office are listed in Table 3 and are also shown on Figure 1, but the symbols on Figure 1 are not keyed to Table 3.

The industrial mineral potential of this part of southern Ontario is becoming recognized. The better graphite occurrences in the area were all staked about a year ago. Some activity on such claims was reported from Montea-

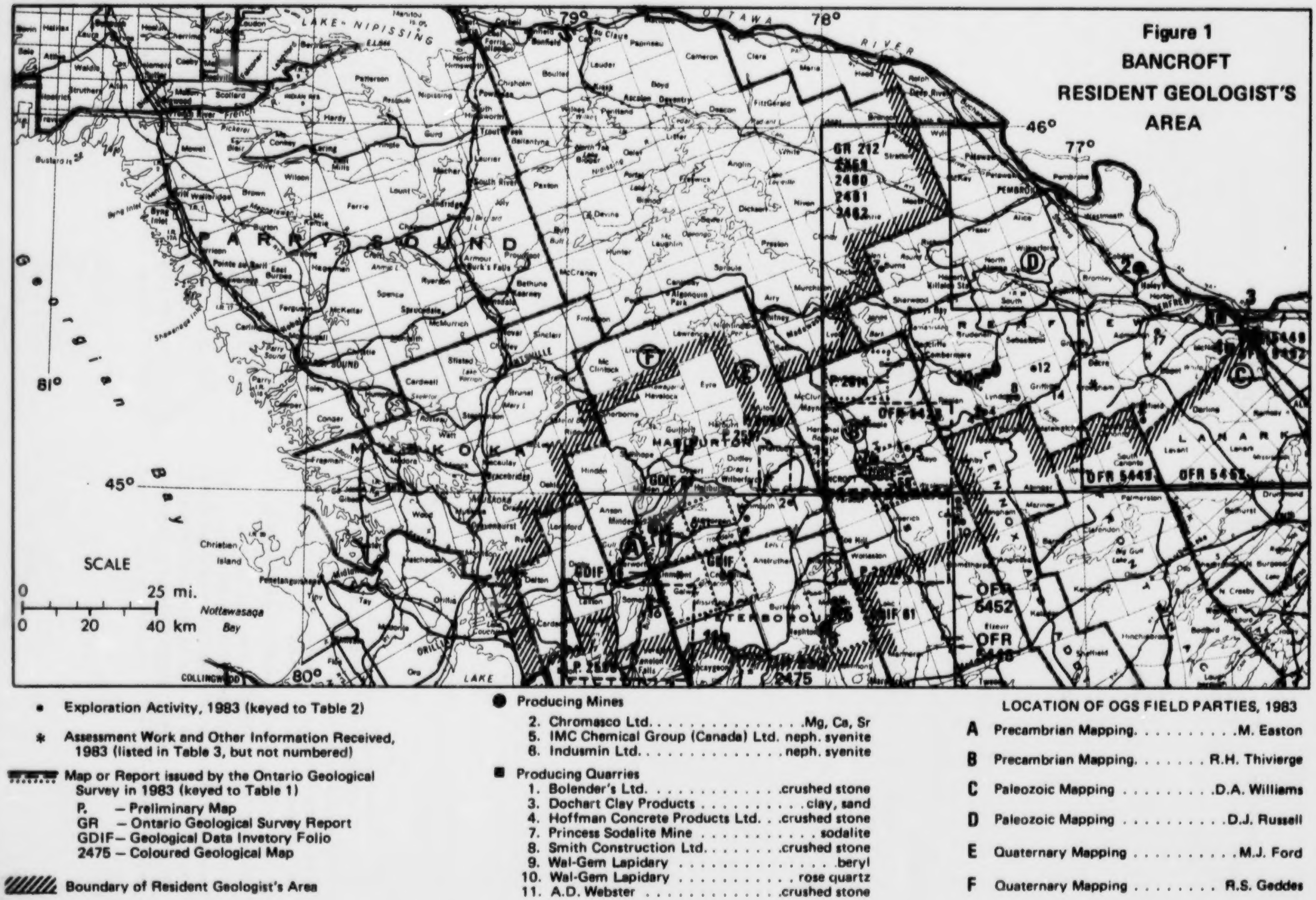

**Figure 1**
**BANCROFT**
**RESIDENT GEOLOGIST'S**
**AREA**

LAKE NIPISSING
OTTAWA RIVER
PARRY SOUND
MUSKOKA
HALIBURTON
PETERBOROUGH
RENFREW
LANARK
LENNOX
Georgian Bay
Nottawasaga Bay
Christian Island
LAKE
PEMBROKE
COLLINGWOOD
79°
78°
77°
46°
45°
81°
80°
GR 212
2459
2460
2461
2462
P.2616
OFR 5449
OFR 5452
OFR 5448
GDIF
GDIF 81
P.2596
2475
A
B
C
D
E
F
SCALE
0
25 mi.
0
20
40 km

- • Exploration Activity, 1983 (keyed to Table 2)
- * Assessment Work and Other Information Received, 1983 (listed in Table 3, but not numbered)
- Map or Report issued by the Ontario Geological Survey in 1983 (keyed to Table 1)
  - P. — Preliminary Map
  - GR — Ontario Geological Survey Report
  - GDIF — Geological Data Invetory Folio
  - 2475 — Coloured Geological Map
- ▨ Boundary of Resident Geologist's Area

● **Producing Mines**

2. Chromasco Ltd. . . . . . . . . . . . . . . . Mg, Ca, Sr
5. IMC Chemical Group (Canada) Ltd. neph. syenite
6. Indusmin Ltd. . . . . . . . . . . . . . . . neph. syenite

■ **Producing Quarries**

1. Bolender's Ltd. . . . . . . . . . . . . crushed stone
3. Dochart Clay Products . . . . . . . . . . clay, sand
4. Hoffman Concrete Products Ltd. . . crushed stone
7. Princess Sodalite Mine . . . . . . . . . . . sodalite
8. Smith Construction Ltd. . . . . . . . crushed stone
9. Wal-Gem Lapidary . . . . . . . . . . . . . . . beryl
10. Wal-Gem Lapidary . . . . . . . . . . . rose quartz
11. A.D. Webster . . . . . . . . . . . . . . crushed stone

LOCATION OF OGS FIELD PARTIES, 1983

| | | |
|---|---|---|
| **A** | Precambrian Mapping. . . . . . . . . . | M. Easton |
| **B** | Precambrian Mapping. . . . . . . | R.H. Thivierge |
| **C** | Paleozoic Mapping . . . . . . . . . | D.A. Williams |
| **D** | Paleozoic Mapping . . . . . . . . . . | D.J. Russell |
| **E** | Quaternary Mapping . . . . . . . . . . | M.J. Ford |
| **F** | Quaternary Mapping . . . . . . . . | R.S. Geddes |

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR.

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | Canadian Nickel Co. Ltd. | Claim Staking (4), Drilling, Methuen Twp. |
| 2 | Clark, A.H., Sr. | Claim Staking (1), Cardiff Twp. |
| 3 | Cloughley, R.N. | Drilling, Dalton Twp. |
| 4 | Crawford, R.J. | Claim Staking (1), Lyndoch Twp.<br>Claim Staking (1), Raglan Twp. |
| 5 | Dubblestein, A.J. | Claim Staking (1), Cashel Twp. |
| 6 | Farr, G. | Claim Staking (10), Glamorgan Twp. |
| 7 | Hamilton, L. | Claim Staking (2), Burns Twp. |
| 8 | Hansen, J.E. | Claim Staking (3), Lyndoch Twp. |
| 9 | MacFadyen, D. | Claim Staking (8), Monmouth Twp. |
| 10 | McMurray, D. | Stripping, Cashel Twp. |
| 11 | Offset Oil and Gas Resources Ltd. | Ground Geophysics, Glamorgan Twp. |
| 12 | Pearse, G.H.K. | Claim Staking (7), Griffith Twp. |
| 13 | Pilatzke, N. | Stripping, Blithfield Twp. |
| 14 | Rennick, M.W. | Claim Staking (4), Griffith Twp. |
| 15 | Rogers, D.P. | Claim Staking (1), Mayo Twp. |
| 16 | Soever, A.T. | Claim Staking (2), Somerville Twp. |
| 17 | Sulpetro Minerals Ltd. | Geophysical Surveys, Drilling, Stripping, Admaston Twp. |

gle, Cardiff, Lyndoch, Griffith, and Herschel Townships. The Monteagle claims have since come open. Activity on the Brougham Township graphite occurrence of Coronation Resources (Canada) Incorporated was at a temporary halt.

A building stone quarry was operated for a few months in Belmont Township this year. The quarry is situated just outside this Resident Geologist's area but it indicates that a market exists for suitable stone.

Demand for high purity calcium and silica continues. Two claims in Burns Township were staked to cover some high quality silica.

High purity calcium deposits probably exist in the Grenville marble, but will require extensive field work to locate.

Nepheline syenite deposits of the Bancroft area periodically receive attention from the mining industry, and this was the case again in 1983.

The metal potential of the area also received some attention. Sulpetro Minerals Limited continued their work on their Admaston property with some drilling and stripping. They also applied for rezoning to the township so that a mine, if found feasible, would be allowed to go ahead.

In Glamorgan Township, a molybdenum-copper showing, known as the Simmonds Showing, was restaked during the year and VLF, magnetic, and scintillometer surveys were carried out.

Minor work was done by the Canadian Nickel Company Limited on their claims in Methuen Township covering some hematite-ilmenite mineralization.

## Mining Activity

The location of the operating mines and quarries is shown in Figure 1.

The same body of nepheline syenite in Methuen Township is being mined by Indusmin Limited near Nephton and by IMC Chemical Group (Canada) Limited near Blue Mountain. Both companies produce a wide range of products for the glass, ceramic, fibreglass, and filler industries. Both companies were working at less than capacity in 1983.

Chromasco Limited, near Haley Station, Ross Township, produces magnesium metal in its reduction plant, from dolomite mined in 2 pits on the property. Based on demand, calcium and strontium metal is also produced, but this production relies on raw materials shipped from elsewhere. Here too, production was less than capacity.

# BANCROFT — ALGONQUIN REGION

TABLE 3 ASSESSMENT WORK AND OTHER INFORMATION RECEIVED.

Abbreviations Used:

DD - Diamond Drilling (where shown, the numbers following "D" indicate the number of holes drilled and the total length drilled respectively).
Geochem - Geochemical Survey
Geophys - Geophysical Survey
GL - Geological Survey
L.U.P. - Land Use Permit
Mag - Magnetometer Survey
Rad - Radiometric Survey
VLF-EM - Very Low Frequency Electromagnetic Survey
Mech - Mechanical
Chem - Chemical
STr - Stripping
Tr - Trenching
BM - Base Metals

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Haliburton Co.<br>Cardiff Twp. | 31E/1 | A.T. Griffis | graphite | GL<br>Geophys. | Mapping<br>VLF-EM | 1982 | 2.4473 | Cardiff<br>207 |
| Haliburton Co.<br>Cardiff Twp. | 31E/1 | A.T. Griffis and (optioned) R. Rinaldi et al | graphite | Control Survey<br>Chem | Analyses | 1981 | 2.4392 | Cardiff<br>208 |
| Haliburton Co.<br>Monmouth Twp. | 31D/16 | Penflo Explorers Inc. | uranium | Geophys.<br>Geochem<br>GL | Rad<br>Sampling<br>Mapping | 1981 | 2.4757 | Monmouth<br>111 |
| Hastings Co.<br>Cashel Twp. | 31C/13 | William R. Barnes Co. Ltd. | talc | Drill Log | DD(2-602') | 1982 | - | Cashel<br>4 |
| Hastings Co.<br>Cashel Twp. | 31C/14 | David McMurray | talc | Mech | power STr | 1982-1983 | - | Cashel<br>5 |
| Hastings Co.<br>Monteagle Twp. | 31F/4 | James W. Gemmell | graphite | Geophys | VLF-EM<br>Mag | 1982 | 2.4464 | Monteagle<br>17 |
| Peterborough Co.<br>Methuen Twp. | 31C/12 | Canadian Nickel Co. Ltd. | ilmenite | Geophys | Mag | 1982 | 2.4798 | Methuen<br>27 |
| Peterborough Co.<br>Methuen Twp. | 31C/12 | Canadian Nickel Co. Ltd. | ilmenite | Drill Log | DD(1-237') | 1983 | - | Methuen<br>28 |
| Peterborough Co.<br>Methuen Twp. | 31C/12 | Canadian Nickel Co. Ltd. | ilmenite | GL | Mapping | 1982 | 2.5469 | Methuen<br>29 |
| Renfrew Co.<br>Bagot Twp. | 31F/4 | Bagot Gold Resources Ltd. | gold | Drill Log<br>Geophys | DD(4-592')<br>VLF-EM<br>Mag | 1981 | 63.3979<br>OM90-PE85-C-81 | Bagot<br>9 |
| Renfrew Co.<br>Blithfield Twp. | 31F/2 | Nickolas Axiotis | ? | Mech | Tr | 1982 | - | Blithfield<br>16 |
| Renfrew Co.<br>Blighfield Twp. | 31F/2 | Norman Pilatzke | ? | Mech | Tr | 1983 | - | Blithfield<br>17 |
| Renfrew Co.<br>Brougham Twp. | 31F/7 | B. Nixon Apple (Coronation Resources) | graphite | Drill Loq | DD(12-3,170') | 1982 | - | Brougham<br>11 |
| Renfrew Co.<br>Lyndoch Twp. | 31F/3 | Russell J. Crawford | ? | Mech<br>Manual | power STr<br>Tr, pits | 1982 | - | Lyndoch<br>24 |
| Renfrew Co.<br>Lyndoch Twp. | 31F/3 | Russell J. Crawford | mo<br>diopside | Geophys | Mag | 1982 | 2.4649 | Lyndoch<br>25 |
| Renfrew Co.<br>Lyndoch Twp. | 31F/6 | Sulpetro Minerals Ltd. | BM | Geochem | Rock Geochemistry<br>Analyses | 1983 | L.U.P.<br>73072 | Lyndoch<br>26 |
| Victoria Co.<br>Dalton Twp. | 31D/4 | Robert Neil Cloughley | ? | Drill Log | DD(1-116') | 1982-1983 | - | Dalton<br>6 |
| Victoria Co.<br>Somerville Twp. | 31D/10 | Sulpetro Minerals Ltd. | BM | GL<br>Geochem | Mapping<br>Soil Sampling | 1981 | 2.4275 | Somerville<br>5 |
| Peterborough Co.<br>Galway Twp. | 31D/15 | Thomas D. Pearson | ? | Sketch | Manual Labour | 1983 | - | Galway<br>33 |
| Renfrew Co.<br>Blithfield Twp. | 31F/2 | Nickolas Axiotis | BM | Geochem | Assays | 1982 | - | Blithfield<br>18 |
| Renfrew Co.<br>Brougham Twp. | 31F/6 | Gary Pearse | graphite | Geophys<br>GL | VLF-EM<br>Mapping | 1982 | 2.5310 | Brougham<br>12 |

Crushed stone for aggregate is produced at 3 quarries in the area. Dolomite is produced at the quarry of Bolender's Limited, Guilford Township, for poultry grit, golf sand, exposed concrete facing, and white bricks. "Leda clay" and local sand are mined by Dochart Clay Products for their line of pottery ware. Rose quartz chips are produced on a demand basis from the West Quarry of Wal-Gem Lapidary in Lyndoch Township, and mineral specimens are produced from both the East and West Quarries. Sodalite for the lapidary trade and mineral collectors is produced on demand basis at the Princess Sodalite Mine, Dungannon Township, just outside of Bancroft.

## Recommendations

The Bancroft area is close to the markets of Ontario, Quebec, and the northeastern United States. Adequate road, rail, and water transportation routes exist, good access is normal, and adequate labour pool, and other features of a stable, well developed infrastructure are in place. A deposit of adequate size and consistent grade should be able to compete in this market.

Potential exists in the area for graphite, talc, high purity calcium, high purity silica, and building stone. Mica as filler is still somewhat of a new industry, but the potential market is seen to be excellent. North American markets also exist for coarse "book" mica (muscovite or phlogopite) which, in the past, has been produced locally from pegmatitic deposits.

In Ontario, Quebec, and New York State, several mines have operated, or are still operating, based on sphalerite associated with carbonate metasediments. Potential for such deposits exists through much of Eastern Ontario.

The Minden-Bancroft-Pembroke area has numerous pegmatite occurrences and, in the past, several mines were developed on these pegmatites. Pegmatites containing mica, silica, calcite, potassic feldspar, radioactive minerals, and rare earth minerals are known. Based on several co-products, it may be possible to bring one, or several adjacent ones, into production.

Gold was thought to have poor economic potential in high grade metamorphic rocks, but the Hemlo find in the North Central Region disproves that assumption. A number of gold occurrences in rocks of medium metamorphic grade (amphibolite facies) are known throughout the area, and the Resident Geologist's study of these and other types of gold deposits continues. The lower grade rocks (greenschist facies) are also recommended for investigation of gold potential.

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# Report of Activities 1983
# Eastern Resident Geologist Area, Eastern Region

**P.W. Kingston[1] and V.C. Papertzian[2]**

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## Introduction

During 1983, Industrial Minerals were once again the main focus of activity by mining companies and prospectors, the Resident Geologist and his staff, and by the Ontario Geological Survey. Emphasis this year centred on gold, fine-grained muscovite mica, and sillimanite. Some interest was also expressed in building stone and silica.

## Resident Geologist's Activities

The office of the Resident Geologist for the Eastern Region is located in Tweed, and is staffed by P.W. Kingston, Resident Geologist, and 5 full time contract geological staff. The contract staff consists of: W.T. Grant, R. Palkovits, V.C. Papertzian, C.P. Verschuren, and D.A. Williams, Norena Dunham, secretary, and L.A. Thatcher, cartographer.

The office of the Regional Mines Coordinator is located in Kemptville and is staffed by T.W. Fletcher, Regional Mines Coordinator, S. van Haaften, Resource Geologist, and 6 contract and part-time staff who include G. Gorrell, R. Trotter, L. Kessel-Taylor, J. Bracken, A. Hinton, and D. Brand. M.A. Klugman was the Regional Mines Coordinator until June of 1983. At that time, he was appointed Regional Director of Sudbury Region and his previous position has now been filled by T.W. Fletcher. Three of the 6 contract staff have also left the Kemptville office. Five Experience '83 students were hired to work on the various geological projects in the Region.

Most geological activities in the Region are managed by the Resident Geologist in Tweed, and all geotechnical

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[1] Resident Geologist, [2] Project Geologist, Ontario Ministry of Natural Resources, Tweed.

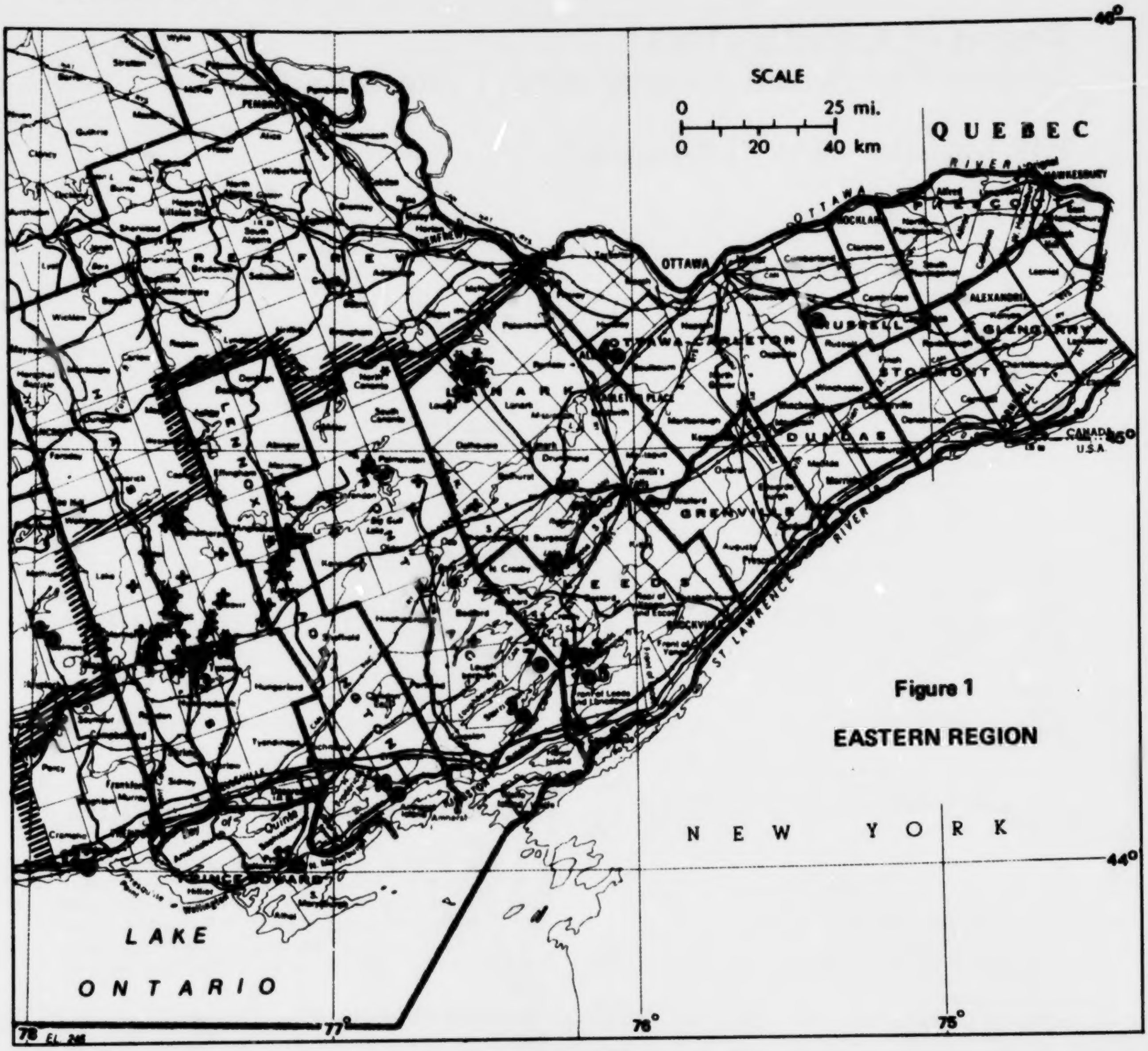
SCALE
0
25 mi.
0
20
40 km
QUEBEC
OTTAWA RIVER
HAWKESBURY
PRESCOTT
ROCKLAND
OTTAWA
RUSSELL
GLENGARRY
ALEXANDRIA
OTTAWA-CARLETON
CARLETON PLACE
STORMONT
DUNDAS
GRENVILLE
LEEDS
BROCKVILLE
LANARK
RENFREW
PEMBROKE
FRONTENAC
ADDINGTON
Quinte
PRINCE EDWARD
ST LAWRENCE RIVER
CANADA
U.S.A.
NEW YORK
LAKE ONTARIO
46°
45°
44°
78
77°
76°
75°
EL 246

Figure 1

EASTERN REGION

EXPLANATION

● Producing Mines (except clay and aggregate extractive operations)

| | | |
|---|---|---|
| 1. | Rideau Granite Inc. | monument stone |
| 2. | W. R. Barnes Co. Ltd. | decorative stone |
| 3. | B. Mulcair | armor stone |
| 4. | MacMillan Quarry | flagstone |
| 5. | F. Wiesner | decorative sandstone |
| 6. | Fairmount Granite | monument stone |
| 7. | Fairmount Granite | monument stone |
| 8. | Domtar Quarry | shale for brick |
| 9. | N. Sloan | decorative stone |
| 10. | Canada Cement Lafarge Ltd. | limestone, cement |
| 11. | Lake Ontario Cement Co. Ltd. | limestone, cement |
| 12. | St. Lawrence Cement Co. Ltd. Ogden Point Quarry | limestone, cement |
| 13. | Canada Talc Industries Ltd. | talc |
| 14. | Grenville Aggregate Specialties Ltd. | marble |
| 15. | Stoklosar Marble Quarries (1969) Ltd. | marble |
| 16. | Steep Rock Ltd. | calcium carbonate |

✚ Claim staking, 1983

✱ Assessment Work Filed, 1983

▨ Boundary of Resident Geologist's Area

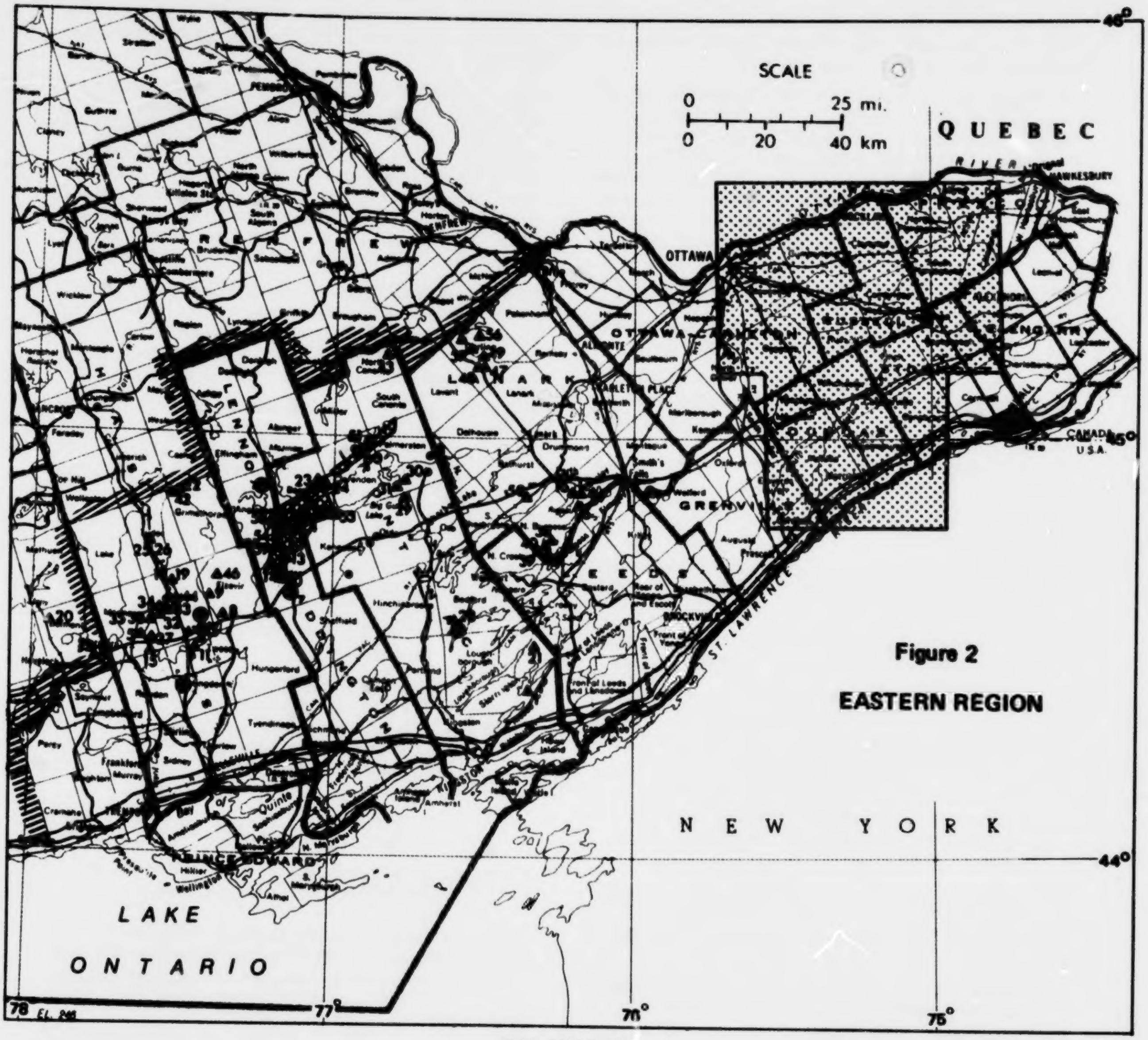
SCALE
0
25 mi.
0
20
40 km
QUEBEC
RIVER
HAWKESBURY
OTTAWA
OTTAWA-CARLETON
LANARK
GRENVILLE
LEEDS
BROCKVILLE
ST. LAWRENCE
KINGSTON
PRINCE EDWARD
Bay of Quinte
CANADA
U.S.A.
NEW YORK
LAKE
ONTARIO
46°
45°
44°
78
77°
76°
75°

Figure 2

EASTERN REGION

**EXPLANATION**

▲ Exploration Activity, 1983 (keyed to Table 2)

▧ Mica Mapping Program

▩ Area of Scintillometer Survey (Marek et al. 1983)

• Mapping of High Potential Carbonate Rock Areas

☐ Sillimanite Mapping Project (Verschuren 1983)

● Geophysical Survey Areas (Papertzian and Grant 1983)

▩ Urban Geology Mapping (Kessell-Taylor et al. 1983)

▨ Slope Stability Study Area (Poschman et al. 1983)

━ Aggregate Assessment Area

▧ Boundary of Resident Geologist's Area

engineering, aggregate assessments, mineral education, and Provincial Parks projects are managed by the Regional Mines Coordinator in Kemptville.

As in previous years, much of the Resident Geologist's time was involved in providing a consultive technical service to companies and individuals engaged in mineral exploration and mining development in Eastern Region. Selected mineral properties in the region were visited during the year, either because of their importance to Ministry programs, or because of interest in, or work by mining and exploration companies. Emphasis was placed on examining properties currently under development, especially those involving industrial minerals. Other activities included conducting and attending geological field trips and tours. Open House meetings dealing with the regional land-use strategies were also attended.

In October 1982, a section 38 Special Employment Program (Mining Sector Work Program) was set up with the Township of Barrie as Project Sponsor. This project, employing 4 geologists, ended on June 28, 1983. It was designed to stimulate interest in the exploration for, and development of, mineral resources in Barrie Township and the immediate surrounding area.

The project provided:

1. A detailed inventory and evaluation of the development potential of mineral resources in the Barrie Township centred area.
2. A total of 18 Geological Data Inventory Folios were produced for Barrie Township and the surrounding area.
3. Two reports were published entitled:
    i. A Report on the Reconnaissance Scintillometer Survey of the Flinton Group by D. Marek, J. Easton, W. Grant, and P.W. Kingston,

    and

    ii. A Report on Geophysical Surveys Conducted in Eastern Ontario by V.C. Papertzian and W.T. Grant.

In mid-May, a 2-day Mines Technical meeting was held in Kingston, Ontario. Progress reports on various programs were tabled at this meeting by the Resident Geologist's staff.

In late May, the 19th Forum on the Geology of Industrial Minerals was attended in Toronto by W.T. Grant, V.C. Papertzian, and C.P. Verschuren.

A field trip was organized to the Teck-Corona Silverfields silver mine in mid-June. A number of geologists from Eastern Region attended.

In late June, an Ontario Municipal Board hearing in Storrington Township was attended by P.W. Kingston and V.C. Papertzian. The hearing dealt with the William R. Barnes Company and their silica deposit in Storrington Township.

Three underground trips were made at the Ore Chimney Gold mine in Barrie Township during the dewatering operation carried out this spring. The 150-foot level was mapped in some detail by P.W. Kingston and V.C. Papertzian, and sampled by Banirwin Mining Explorations Limited.

Two trips were made to the Cordova Mines property in Belmont Township, where Laisir Gold Incorporated in conjunction with Mintek Group Canada Incorporated are constructing a small 500 ton-per-day hydrometallurgical mill to rework the tailings. To date, eight 35 000 gallon tanks have been erected to handle the material and 2 holding ponds have also been constructed. Work appears to have been suspended for the moment, pending further research into the process being contemplated.

A number of field visits were made to Canada Talc Industries Limited this year. The open pit which was developed late last year has not changed in dimensions to date. The company is currently stripping an area of high grade dolomite immediately west of their mill to be used as a filler.

A river bottom survey was carried out in late September by the Tweed geological staff on behalf of the Crowe River Conservation Authority. The geology along a 1 km stretch was mapped and the depth of the river was ascertained along 20 traverses at 20-meter intervals.

The Ontario Geological Survey field trip to southwestern Ontario was attended by P.W. Kingston, V.C. Papertzian, D.A. Williams, and S. van Haaften. A number of gravel operations were visited, as well as the Canada Lafarge Cement plant at Ingersoll, Ontario. One full day was devoted to Pleistocene geology. The final day was spent at the Oil Springs oil museum.

As part of the region's Industrial Minerals Program, P.W. Kingston, V.C. Papertzian, S. van Haaften, C.P. Verschuren, and W.T. Grant made a field visit to the Lewis wollastonite mine owned and operated by the N.Y.C.O. division of Processed Minerals Incorporated, in northern New York State.

## Mining Activity

Producing mines and stone quarries in Eastern Ontario are shown in Figure 1. The 3 cement producers (Canada Cement Lafarge Limited, Lake Ontario Cement Company Limited, and the St. Lawrence Cement Company Limited) were in production throughout 1983.

Lake Ontario Cement Limited operated a cement plant and limestone quarry near Picton. The company facilities are located immediately southeast of Highway 49. In 1981 and 1982, the company undertook the construction of a tunnel under Highway 49. This tunnel is 142 m long, 10.6 m wide, and 7.6 m high, and enables the company to open their property to the northwest of the existing quarry. The cost of this project was approximately $1.25 million and was operational in the summer of 1983. The company produces Canadian and American standard specification cement and they also produce low alkaline and fast-setting cements.

TABLE 1

ASSESSMENT WORK AND OTHER INFORMATION RECEIVED

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| Anglesea Township | 31/C/14 | Ultimate Energy & Resources Ltd. | Au | Assess. | DD10-1445 | 1978 | - | - |
| Barrie Township | 31/C/14 | S. Bartlett | Au | Assess. | STr | 1982 | - | 83-25 |
| Barrie Township | 31/C/14 | S. Bartlett | Au | Assess. | Assay | 1983 | 2.5776 | 83-26 |
| Barrie Township | 31/C/14 | S. Bartlett | - | Assess. | Assay | 1982 | 2.5033 | - |
| Barrie Township | 31/C/14 | D. A. Hardie | - | Assess. | RTr, Tr | 1983 | - | 83-41 |
| Barrie Township | 31/C/14 | D. A. Hardie | - | Assess. | Tr | 1983 | - | 83-42 |
| Barrie Township | 31/C/14 | Sulpetro Minerals Ltd. | - | Assess. | EM, Mag | 1982 | - | 82-10 |
| Barrie Township | 31/C/14 | Sulpetro Minerals Ltd. | - | Assess. | EM, Mag | 1981 | 2.4696 | - |
| Darling Township | 31/F/2 | Steep Rock Resources Inc. | Marble | Assess. | DD1-306 | 1983 | - | 83-19 |
| Darling Township | 31/F/2 | Steep Rock Resources Inc. | Marble | Assess. | DD1-532 | 1983 | - | 83-20 |
| Darling Township | 31/F/2 | Steep Rock Resources Inc. | - | Assess. | DD3-1290 | 1983 | - | 83-29 |
| Darling Township | 31/F/2 | Terra Surveys Ltd. | - | Assess. | EM | 1982 | - | 83-1 |
| Darling Township | 31/F/2 | Terra Surveys Ltd. | - | Assess. | Gr | 1980 | 2.4410 | - |
| Darling Township | 31/F/2 | Terra Surveys Ltd. | - | Assess. | GL | 1983 | - | 83-21 |
| Elzevir Township | 31/C/11 | James L. Byer | Talc | Assess. | DD2-1087 | 1982 | - | 82-30 |
| Elzevir Township | 31/C/11 | James L. Byer | - | Assess. | DD2-303 | 1982 | - | 83-2 |
| Grimsthorpe Township | 31/C/13 | J. H. Paterson | - | Assess. | VLF, Mag | 1981 | 2.4824 | 82-21 |
| Kaladar Township | 31/C/11 | James L. Byer | - | Assess. | DD2-405 | 1982 | - | 82-57 |
| Kaladar Township | 31/C/11 | E & B Explorations Inc. | Au | Assess. | GL, Geophys. | 1982 | 2.5065 | - |
| Kaladar Township | 31/C/14 | Sulpetro Minerals Ltd. | - | Assess. | EM, Mag | 1982 | - | 82-9 |
| Kaladar Township | 31/C/11 | C. Roger Young | - | Assess. | DD1-124 | 1983 | - | 83-31 |
| Kaladar Township | 31/C/11 | C. Roger Young | - | Assess. | DD1-344 | 1983 | - | 83-32 |
| Madoc Township | 31/C/12 | C. L. Emery | - | Assess. | Tr | 1982 | - | 82-53 |
| Madoc Township | 31/C/12 | C. L. Emery | - | Assess. | STr, Tr | 1982 | - | 82-54 |
| Madoc Township | 31/C/12 | R. G. Nash | - | Assess. | rTr | 1982 | - | 83-7 |
| Madoc Township | 31/C/12 | R. G. Nash | - | Assess. | STr | 1982 | - | 83-8 |
| Madoc Township | 31/C/12 | R. G. Nash | - | Assess. | STr | 1983 | - | 83-9 |
| Madoc Township | 31/C/11 | E. C. Sager | Au | Assess. | DD2-502 | 1982 | - | 83-3 |
| Marmora Township | 31/C/12 | Bowdidge and Associates Ltd. | - | Assess. | EM, Mag | 1983 | - | 83-17 |
| Marmora Township | 31/C/5 | R. L. V. Ekstrom | - | Assess. | Geophys. | 1983 | - | 83-33 |
| Marmora Township | 31/C/12 | J. Herrington | - | Assess. | Geophys. | 1982 | 2.5255 | 82-46 |
| Marmora Township | 31/C/12 | R. G. Nash | - | Assess. | RTr | 1983 | - | 83-34 |
| Marmora Township | 31/C/12 | R. G. Nash | - | Assess. | RTr | 1983 | - | 83-35 |
| North Burgess Township | 31/C/9 | Orwell Energy Corporation Ltd. | gf | Assess. | Tech. report | 1982 | 2.5040 | 82-31 |
| North Burgess Township | 31/C/9 | Orwell Energy Corporation Ltd. | gf | Assess. | Tech. report | 1981 | - | 82-32 |
| North Burgess Township | 31/C/9 | Orwell Energy Corporation Ltd. | gf | Assess. | GL, Geophys. | 1983 | - | 83-28 |
| North Burgess Township | 31/C/9 | Orwell Energy Corporation Ltd. | gf | Assess. | DD2-600 | 1983 | - | 83-30 |
| North Canonto Township | 31/F/2 | W. Pilatzke | - | Assess. | Tr | 1982 | - | 82-55 |

TABLE 1 Continued

| Location | NTS | File Name | Commodity Sought | Type of Report | Type of Work Performed | Date of Work | Toronto File Number | Local File Number |
|---|---|---|---|---|---|---|---|---|
| North Elmsley Township | 31/C/16 | Bowdidge and Associates Ltd. | - | Assess. | Geophys. | 1982 | - | 83-22 |
| North Elmsley Township | 31/C/16 | Bowdidge and Associates Ltd. | - | Assess. | Geophys., GL | 1982 | - | 83-23 |
| North Elmsley Township | 31/C/16 | R. L. V. Ekstrom | - | Assess. | VLF, HLEM, GL | 1982 | - | 83-11 |
| North Elmsley Township | 31/C/16 | R. L. V. Ekstrom | - | Assess. | Mag | 1982 | - | 83-12 |
| Olden Township | 31/C/15 | A.J.M. Metals Ltd. | U | Assess. | GL, Rad | 1983 | - | 83-45 |
| Palmerston Township | 31/C/15 | A.J.M. Metals Ltd. | U | Assess. | GL, Rad | 1983 | - | 83-43 |
| Palmerston Township | 31/C/15 | A.J.M. Metals Ltd. | U | Assess. | GL, Rad | 1983 | - | 83-44 |
| Tudor Township | 31/C/12 | H. Helm | - | Assess. | Assay | 1983 | 2.5523 | 83-13 |
| Tudor Township | 31/C/12 | H. Helm | - | Assess. | STr, rTr | 1983 | - | 83-14 |

Grenville Aggregate Specialties Limited and Stoklosar Marble Quarries (1969) Limited amalgamated in mid 1983 to form one company known as Stoklosar Marble Quarries Limited. Both continued production of marble specialty products and terrazzo chips.

Steep Rock Resources Limited, Calcite Division, operates a calcite quarry at Tatlock and a processing plant near Perth. Between 100 000 and 150 000 tons per year of calcite are quarried in 2 months in late summer, crushed, and trucked to a stock pile at the Perth plant. This plant was expanded this year, doubling the fine grind capacity at a cost of $7.1 million. The Ontario Government through the Board of Industrial Leadership and Development (BILD) contributed $1.35 million to this expansion. Production in the expanded plant began during the year on a commercial scale and market acceptance of the products is good.

Steep Rock Resources Limited have also been carrying out an active exploration program for silica and are studying the possibilities of developing a silica mine in the Perth area. In addition, the company has been looking for other industrial mineral deposits in Eastern Ontario.

Canada Talc Industries Limited continued production of talc and dolomite at their mine in Huntingdon Township. Production this year was approximately 15 000 tons of both talc and dolomite. The company has completed stripping of the new 2 million ton northwest orebody and is prepared as of December 15, 1983 for drilling for the first blast. An estimated 40 000 tons will be broken in late 1983 to be crushed and stockpiled for dolomite chips and low grade talc-dolomite for bulk shipment, and for use in the new Marmora plant.

The company is in the final planning stages for a new 100 000 ton-per-year talc and dolomite processing plant. This $3.8 million fine-grind facility will produce 44, 20, and 10-micron size talc and dolomite products for the paint and paper industry. This plant will be located on a portion of the former Marmoraton Iron Mines plant site purchased by Canada Talc Industries Limited. Construction is expected to start early in 1984.

The W.R. Barnes Company Limited will be custom milling talc ore for Canada Talc Industries Limited at Barnes' Northbrook plant. This custom mill will produce talc products for the roofing and automotive body filler markets.

Diamond Peat Moss Limited sold its peat bog in Stormont Township. The company now imports all of its products and packages them for resale at its facility north of Cornwall. The new owner of the peat bog has not yet started a commercial operation.

## Exploration Activity

In 1983, approximately 266 new claims were recorded in Eastern Ontario, an increase of 37 claims over 1982. This increase is partly the result of exploration for talc, mica, sillimanite, and marble, as well as the continued exploration for gold.

Figure 1 shows the area of claim staking activity during the year as well as assessment work filed. Claim staking activity increased by 14%, while claim cancellations decreased to 122 compared to 347 last year in Eastern Region (*see* Figure 3). Figure 2 shows the location of properties on which exploration work has been carried out.

Much of the exploration work undertaken in Eastern Ontario is on private land. Therefore, the companies are under no obligation to report their activities. Many of the companies, however, have cooperated in keeping the Ontario Ministry of Natural Resources informed of their activities. In many cases, companies have voluntarily supplied information on a confidential basis. It is, therefore, not possible to report on all of the exploration activity in the Eastern Region.

## Gold

E & B Explorations Incorporated of Vancouver carried out a 6000 foot diamond drilling program at the Addington Mine (Golden Fleece Deposit) during the summer of 1983. Since the winter of 1980, the company has drilled a total of 24 000 feet; results have been encouraging and further work is being considered.

The Ore Chimney Gold Mine was dewatered to the 150-foot level as was described earlier. Resampling of the level was completed by Banirwin Mining Explorations Limited and 5 short drillholes were drilled at various locations along the drift. The 150-foot level was mapped in detail by J.M. Moore of Carleton University and by the geological staff from the Tweed Ministry of Natural Resources Office.

The Kennedy group in conjunction with Sumach Resources Limited is now evaluating the Silver King Gold Mine in Elzevir Township. This gold, silver, lead prospect is located in lot 25, concession IV. Geological and geophysical surveys are scheduled for the property.

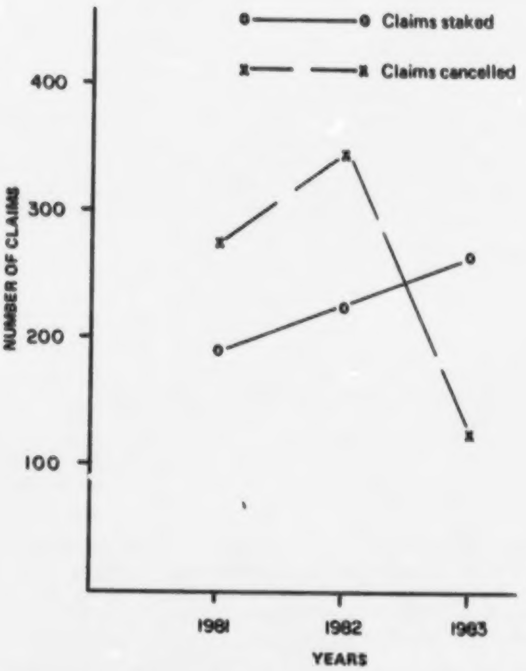

Figure 3 – Claim Staking and Cancellation Activity in Eastern Ontario.

Over 80 claims have been staked in the northwestern corner of Grimsthorpe Township by several parties. The interest is centred on the small former producing Gilmour Gold Mine.

The former Cordova Gold Mine in Belmont Township experienced considerable exploration and development activity this past year. The following description of activities is quoted from the Marmora Herald of September 28, 1983:

> *Walter Hood, president of Lasir Gold Inc. which has for the past four years carried on extensive testing on the tailings, last week announced that his company Lasir Gold Inc. has entered into an agreement with W.H.B. Chan and Company, a private company headquartered in Los Angeles, California, to develop the Cordova Mines property. W.H.B. Chan and Company operates in Canada as Minetek Group Canada Inc. and Minetek Services Canada Inc.*
>
> *Some 115 000 tons of old mill tailings have been surveyed and sampled with an average grade of 0.1 oz. ton Au. Old ore dumps on the property provide another approximately 50 000 tons of comparable grade that will require crushing before treatment. W.G. Wahl Limited did an assessment of the underground ore potential at Cordova Mines and concluded that there were some 200 000 tons grading 0.18 oz ton Au that could be recovered without further development work from the existing flooded underground workings.*

Initial plans are to construct a 500 ton-per-day hydrometallurgical mill.

## Base Metals

Sulpetro Minerals Limited has carried out a limited geological program exploring for zinc on the former Selco property near Little Green Lake in Clarendon Township.

## Mica

The muscovite property near Kaladar did not experience any renewed activity this year. The 5000-ton bulk sample that was shipped last year to Japan has been processed and distributed to approximately 400 companies for products testing. The owner of the deposit, the Koizumi Group, is still looking for a partner to operate the Kaladar property.

Some staking activity occurred in the Clarendon-Palmerston pelitic schist belt for mica. A large part of this belt is patented ground and as such is not open for staking.

## Graphite

Because of the positive response of the mining sector to exploration for graphite, no further new work on graphite has been carried out by the Resident Geologist's office. Work by at least 4 companies is in progress, and as of late 1993, all properties with any promise are held in good standing by the companies involved.

# EASTERN REGION

TABLE 2

EXPLORATION ACTIVITY DURING THE YEAR

| Number on Figure | Individual or Company | Activity |
|---|---|---|
| 1 | W. R. Barnes Company Limited | Rezoning application, Storrington Township. |
| 2 | S. Bartlett | Trenching, Barrie Township. |
| 3 | S. Bartlett | Assay, Barrie Township. |
| 4 | S. Bartlett | Assay, Barrie Township. |
| 5 | Bowdidge and Associates Limited | Geophysics, Marmora Township. |
| 6 | Bowdidge and Associates Limited | Geophysics, North Elmsley Township. |
| 7 | Bowdidge and Associates Limited | Geophysics and Geology, North Elmsley Township. |
| 8 | James L. Byer | Diamond drilling, Elzevir Township. |
| 9 | James L. Byer | Diamond drilling, Elzevir Township. |
| 10 | James L. Byer | Diamond drilling, Kaladar Township. |
| 11 | Canada Talc Industries Limited | Diamond drilling, Huntingdon Township. |
| 12 | Cordova Gold Mine | Overburden drilling, plant construction, Belmont Township. |
| 13 | E & B Explorations Incorporated | Geophysics and geology, Kaladar Township. |
| 14 | E & B Explorations Incorporated | Diamond drilling, Kaladar Township. |
| 15 | R. L. V. Ekstrom | Geophysics, Marmora Township. |
| 16 | R. L. V. Ekstrom | Geophysics and geology, North Elmsley Township. |
| 17 | R. L. V. Ekstrom | Geophysics, North Elmsley Township. |
| 18 | C. L. Emery | Trenching, Madoc Township. |
| 19 | C. L. Emery | Trenching, Madoc Township. |
| 20 | Fairmount Granite | Test quarrying, Belmont Township. |
| 21 | Fairmount Granite | Test quarrying, Storrington Township. |
| 22 | Gilmour Gold Mine | Geological evaluation, Grimsthorpe Township. |
| 23 | D. A. Hardie | Trenching, Barrie Township. |
| 24 | D. A. Hardie | Trenching, Barrie Township. |
| 25 | N. Helm | Assay, Tudor Township. |
| 26 | N. Helm | Trenching, Tudor Township. |
| 27 | J. Herrington | Geophysics, Marmora Township. |
| 28 | Kirkham Graphite | Market assessment, Bedford Township. |
| 29 | A. J. M. Metals Limited | Geology and radiometrics, Olden Township. |
| 30 | A. J. M. Metals Limited | Geology and radiometrics, Palmerston Township. |
| 31 | A. J. M. Metals Limited | Geology and radiometrics, Palmerston Township. |
| 32 | R. G. Nash | Trenching, Madoc Township. |
| 33 | R. G. Nash | Stripping, Madoc Township. |
| 34 | R. G. Nash | Stripping, Madoc Township. |
| 35 | R. G. Nash | Trenching, Marmora Township. |
| 36 | R. G. Nash | Trenching, Marmora Township. |
| 37 | Ore Chimney Gold Mine | Dewatering, drilling and sampling, Barrie Township. |
| 38 | Orwell Energy Corporation Limited | Technical report, North Burgess Township. |
| 39 | Orwell Energy Corporation Limited | Technical report, North Burgess Township. |
| 40 | Orwell Energy Corporation Limited | Geology and geophysics, North Burgess Township. |
| 41 | Orwell Energy Corporation Limited | Diamond drilling, North Burgess Township. |
| 42 | J. H. Paterson | Geophysics, Grimsthorpe Township. |
| 43 | W. Pilatzke | Trenching, North Canonto Township. |
| 44 | Richardson Gold Mine | Geological evaluation, Madoc Township. |
| 45 | E. C. Sager | Diamond drilling, Madoc Township. |
| 46 | Silver King Gold Mine | Trenching, geology, Elzevir Township. |
| 47 | Steep Rock Resources Incorporated | Diamond drilling, Darling Township. |
| 48 | Steep Rock Resources Incorporated | Diamond drilling, Darling Township. |
| 49 | Steep Rock Resources Incorporated | Diamond drilling, Darling Township. |
| 50 | Steep Rock Resources Incorporated | Diamond drilling, Bathurst Township. |
| 51 | Sulpetro Minerals Limited | Geology, geophysics, Clarendon and Palmerston Townships. |
| 52 | Sulpetro Minerals Limited | Geophysics, Barrie Township. |
| 53 | Sulpetro Minerals Limited | Geophysics, Barrie Township. |
| 54 | Sulpetro Minerals Limited | Geophysics, Kaladar Township. |
| 55 | Terra Surveys Limited | Geophysics, Darling Township. |
| 56 | Terra Surveys Limited | Geophysics, Darling Township. |
| 57 | Terra Surveys Limited | Geological survey, Darling Township. |
| 58 | Ultimate Energy and Resources Limited | Diamond drilling, Anglesea Township. |
| 59 | C. Roger Young | Diamond drilling, Kaladar Township. |
| 60 | C. Roger Young | Diamond drilling, Clarendon Township. |
| 61 | C. Roger Young | Diamond drilling, Kaladar Township. |

The Kennedy group has obtained an option agreement with Falconbridge Limited to carry out an exploration program on the Kirkham Graphite property. The Kirkham Graphite property is located in Frontenac County, Bedford Township, on concessions IV and V, lot 4. This property has drill proven reserves of 214 000 tons grading approximately 11% C.

# Industrial Minerals Program

The Industrial Minerals Deposit Testing Program is a joint Government of Ontario and Government of Canada program, which is part of the Canada-Ontario, Eastern Ontario Subsidiary Agreement. The program seeks to identify, catalogue, and direct attention to the "industrial mineral potential" of southeastern Ontario. A combined program of geological, geophysical, and mineral potential studies, mineral economics, and commodity appraisals has been undertaken by the regional geological staff to encourage the private sector to explore for industrial minerals in high potential target areas. Activities under this program are summarized below.

## Carbonate Rocks

The purpose of the calcium carbonate survey was 3-fold: (1) to identify areas of high calcium marble suitable as an industrial mineral source; (2) to assess the variability of marbles; (3) and to determine the Ca/Mg ratio for each marble belt as a guide to industrial mineral and base-metal mineralization. Approximately 1860 samples were collected from lithologically homogeneous units, and these samples were chemically analyzed for 20 elements by the Geoscience Laboratories, Ontario Geological Survey, Toronto. An open file report, "Chemistry of Grenville Carbonate Rocks (Part 1)", was released in the spring of 1982 (Papertzian and Kingston 1982a).

Examination of the chemical data for the 1860 samples allowed the selection of 70 sites where CaO exceeded 54%, and $SiO_2 + Al_2O_3$ was <1%. Rock of this composition is chemically suitable for the filler, lime, and whiting industry, and low in abraisiveness as required for use as fillers. The 70 sites were carefully mapped at a scale of 1:3600 to assess the possible tonnage potential, geological continuity, and chemical consistency over a wider area. An open file report, entitled "Appendix to Chemistry of Grenville Carbonate Rocks (Part 2)", was released in 1982 giving trace element data for 600 of the samples (Papertzian and Kingston 1982b).

A statistical analysis was carried out on all 1912 geochemical analyses to determine elemental associations as well as anomalous levels for use in exploration work. Individual maps of the 72 areas of high potential, as well as the statistical analyses will be published in early 1984 in the form of an Ontario Geological Survey Mineral Deposit Circular. This will provide data on the quality and distribution of marble deposits throughout the area, as well as providing a comprehensive data base upon which several companies have already carried out extensive geological field programs.

Company responses to the release of data was excellent. At least 4 companies carried out exploration, staking, and drilling programs as a direct result of this project.

In December 1983, W. Grant and P.W. Kingston presented at the Ontario Geological Survey Geoscience Research Seminar a poster display of mapping, statistical data, and chemical analyses designed to promote marble development opportunities.

## Muscovite Mica

A brief analysis of geological data on the occurrence of high grade muscovite schists in Eastern Ontario was undertaken in 1981 (*see* Figure 3). Results indicated that potential existed for additional high grade zones in the Clare River Syncline (i.e. other than the Omya-Koizumi property) and in the Clarendon-Palmerston Township area. Following announcement of this data at the 1981 Ontario Geoscience Research Seminar, several companies expressed an interest.

Following presentation of a paper by P.W. Kingston, entitled "Industrial Mineral Opportunites in Eastern Ontario", at the Canadian Institute of Mining and Metallurgy annual general meeting in April 1982, in Quebec City, 2 companies acquired properties, one each in the Kaladar, and Fernleigh areas. A paper was also presented at the Eastern Region Industrial Minerals Seminar in Ottawa by P.W. Kingston entitled "Muscovite Deposits and their Potential as Sources of Mineral Fillers".

In the fall of 1982, a mica mapping program was initiated, aimed at delineating the local and regional geological setting of these muscovite deposits. Field mapping in the Clare River Synform has resulted in the recognition of 3 muscovite-quartz bearing zones which range from 30 to 100 m width and several kilometres in length. These zones, derived from aluminous sediments, vary in muscovite grade both laterally and along strike. The major gangue mineral is quartz, plus or minus biotite, garnet, plagioclase, kyanite, staurolite, sillimanite, hematite, magnetite, chalcopyrite, molybdenite, and pyrite. High grade muscovite zones average 50 to 55% muscovite and 45 to 50% quartz. The main economic development potential for muscovite is in this zone, and the recently formed company of Kaladar IMKO Incorporated has completed an initial shipment of 5000 tonnes of muscovite ore to Japan.

In 1983, two additional areas delineated by the earlier work were examined in detail. An area from Fernleigh to Plevna, some 10 to 12 km long, was mapped and sampled. The pelitic schists are both narrow and continuous and do not appear to have a high potential for development of a high grade muscovite deposit. However, a few zones do occur grading up to 40 to 50% muscovite.

The second zone, just north of Little Green Lake in Clarendon Township, is much wider although only a mile in length. Detailed mapping at a scale of 1 cm = 10 m was completed in the late fall of 1983 on this property subsequent to the discovery by the Resident Geologist's staff that this zone contains a very large deposit of the aluminosilicate mineral sillimanite, which appears to have a high development potential; the mica in this zone is low grade and of poor quality; but the sillimanite grades up to 50% over substantial widths. Preliminary results of this mapping have been published in the 1983 Summary of Field Work (Verschuren 1983a). Industry attention has recently focused on this area as a source of sillimanite. Two major companies have taken bulk samples for laboratory testing; preliminary results are reported to be promising.

In December 1983, C.P. Vershcuren presented a paper on the "Industrial Mineral Potential of Grenville Pelitic Metasediments in Eastern Ontario" at the Ontario Geological Survey Geoscience Research Seminar, focusing on the development potential of mica, sillimanite, and garnet.

## Barite-Fluorite Veins

D.A. Williams and G.B. Keep carried out field examination and sampling of 70 post-Ordovician veins composed of calcite, fluorite, barite, celestite, galena, sphalerite, and chalcopyrite. The field program was expected to result in the establishment of well defined guidelines for exploration and additional deposits. Significant past production from vein deposits included the following: 90 000 tons of fluorite, 1 million tons of high purity calcite, 905 000 tons of 5% lead ore, and lesser amounts of barite, and celestite (Williams 1982).

Publication of an open file report on the barite-fluorite veins was postponed because D.A. Williams was temporarily transferred to the Ottawa-St. Lawrence Lowland Paleozoic geology mapping program. As this program involved considerable structural geology mapping which is directly related to the post-Ordovician veins, this mapping was expected to contribute materially to the barite-fluorite project.

Laboratory analysis of 61 samples, collected in 1981, was completed for 27 elements. In May 1982, D.A. Williams presented a paper at the Eastern Region Industrial Minerals Seminar in Ottawa, concerning the inventory, structural analysis, and metallogenic classification of these veins.

Geological maps (scale 1:50 000) of the Ottawa Valley, scheduled for publication in early 1984, were prepared by D.A. Williams. The maps show the locations of faults, which are important controls for vein localization, and the accompanying marginal notes for maps covering the western part of the Ottawa Valley (Quyon-Arnprior, Carleton Place, Perth, and Westport) describe known vein deposits.

In December 1983, D.A. Williams presented a formal paper on "Structural Geology of Eastern Ontario" at the Ontario Geological Survey Geoscience Research Seminar. This paper highlighted the structural control of barite-fluorite-celestite veins in this area and suggested a number of promising exploration targets.

## Silica

As part of the ongoing Ontario Ministry of Natural Resources program on silica, a cooperative program with CANMET was undertaken to test a number of differing grades of silica for suitability as a foundry sand. CANMET carried out the laboratory segment of the study, while the Ontario Ministry of Natural Resources provided field data and samples. Five diamond-drill holes were drilled in 1981 to obtain 10 m samples through the section. In addition, a 200 kg surface sample was taken from a site believed to be of foundry sand potential.

Two open file reports on silica in Eastern Ontario on high potential areas and on beneficiation methods have been published under this program (Powell and Klugman 1979; Klugman and Yen 1980).

At least 7 major companies have been evaluating properties held in the Kingston-Perth area. Several companies have spent upwards of $0.5 million each in drilling, testing, and property acquisition; total industry expenditures on silica exceed $1.8 million.

In 1983, CANMET completed a laboratory study on the potential for glass sand and foundry sand based on selected deposits of Potsdam sandstone in the Ottawa-Kingston area. Impurities included pyrite, iron oxides, calcite, and feldspar. Beneficiation included size reduction, removal of fines by attrition scrubbing and washing, and further removal of impurities by reverse floatation. Floatation resulted in a substantial improvement in the quality of most samples, the quartz concentrates analyzing 98.5 to 99.7% $SiO_2$, 0.022 to 0.156% $Fe_2O_3$, and 0.07 to 0.62% $Al_2O_3$. Further reduction of the iron content by wet magnetic separation and acid leaching also was investigated. On the basis of the samples submitted, sandstones from 6 of the 7 deposits studied have potential as sources of glass sand. Foundry sand tests were inconclusive because of the limited quantity of samples available for study.

## Talc

Field work carried out by S. van Haaften and A.F. Young in 1980 resulted in an inhouse report on the geology of 14 talc deposits in Eastern Region. During 1981-82, a vigorous program of property acquisition, exploration, and drilling by 3 companies tied up most of the promising talc showings in the region, thus precluding the advisability of Ministry programmes at that time.

In 1982, a re-examination of the literature identified 42 talc deposits; 9 more deposits were mapped and sampled, and an open file report is being prepared for publication in 1984. This report will summarize the results of field investigations and previous work for all known talc deposits in southeastern Ontario.

Detailed mapping of the Queensboro Road Talc Occurrence by Verschuren (1982) and O.J. Steele was specifically aimed at discovering the typical geological setting, physical and chemical characteristics and genesis of talc deposits and mafic to ultramafic affiliation. Results of this mapping have been published in the 1982 Summary of Field Work (Miscellaneous Paper 106). In addition, a paper entitled "Evaluation of Talc Occurrences in Eastern Ontario", was presented by A.F. Young at the Eastern Region Industrial Minerals Seminar in Ottawa, May 1982.

At this time, it appears that good potential for developing medium to large tonnage talc deposits exists both in Grenville carbonate rocks and in the Grenville mafic to ultramafic volcanic rocks in the Elzevir-Cashel area.

## Graphite

A field evaluation program of graphite properties in Eastern Ontario was carried out by V.C. Papertzian and P.W. Kingston. The 54 known properties were studied in a literature survey and the 18 showing the most potential were mapped in detail. The survey data indicated 8 had sufficient merit to warrant further exploration work by companies. The data was published in an open file report, "Graphite Development Potential in Eastern Ontario" (Papertzian and Kingston 1982c), in early 1982. By the late spring of 1982, all the graphite properties showing any promise had been acquired by a number of mining companies and several were planning exploration programs.

A paper, entitled "Graphite Development Potential in Eastern Ontario", was presented by V.C. Papertzian at the Eastern Region Industrial Minerals Seminar in Ottawa, in May 1982.

Because of the positive response of the mining sector, no further new work on graphite has been carried out under this program. Work by at least 4 companies is in progress, and as of late 1983, all properties with any promise are held in good standing by the companies involved.

## Aggregate Resources

The assessment of aggregates of the Eastern Region continued this year. The sand and gravel assessments for the Counties of Frontenac, and Lennox and Addington were completed during the 1983 field season (Figure 3), concluding the sand and gravel assessment for all of Eastern Region.

Detailed field investigation, geophysical testing, and surficial drilling were carried out in the Counties of Frontenac, and Lennox and Addington. A total of 197 samples were collected and tested to determine their suitability. A total of 245 seismic lines were also completed. The drilling was centred on the northern portion of the counties where a total of 128 holes were drilled for a total of 1247 m. Mapping was also carried out to determine the depth to Paleozoic bedrock. All field work has now been completed for the Counties of Stormont, Dundas, Glengary, Prescott, Russell, Lanark, and Leeds.

## Ontario Geological Survey Activities

Field parties from the Mineral Deposits, Geophysics, and Engineering and Terrain Geology Sections of the Ontario Geological Survey were active in the Eastern Region during the 1983 season, as shown in Figure 4.

Williams and Rae (1983) mapped the Paleozoic geology of the Ottawa-St. Lawrence Lowland. Geological mapping during the summer of 1983 was a continuation of the 1981 and 1982 mapping programs (Carson 1982; Williams and Wolf 1982), and involved completion of mapping in the Quyon (31 F/9) and Arnprior (31 F/8) map areas, and additional examination of the following map areas: Carleton Place (31 F/1), Perth (31 C/16), Westport (31 C/9), Ottawa (31 G/5), Kemptville (31 G/4), Merrickville (31 B/13), Brockville (31 B/12), Mallorytown (31 B/5), Thurso (31 G/11), Russell (31 G/6), Winchester (31 G/3), Morrisburg (31 B/14), Hawkesbury (31 G/10), Alexandria (31 G/7), Cornwall (31 G/2), Lachute (31 G/9), Vaudreuil (31 G/8), and Huntingdon (31 G/1). The report area is bounded by the Ottawa and St. Lawrence Rivers, Longitude 76°30'W, and the Ontario-Quebec border.

Mapping was also conducted in the Peterborough-Kingston (Carson 1980, 1981a, 1981b) and Pembroke-Renfrew (Russell 1981) areas, in order to establish a uniform stratigraphic nomenclature which is applicable to the Ottawa-St. Lawrence Lowland.

Barlow (1983) supervised the continued development of a commercial aeromagnetic gradiometer. In March 1982, a contract was made with Kenting Earth Sciences Limited for the company to develop an airborne gradiometer system and to test fly 2 areas. The instrumentation was completed in 1982, and test flying was done in January 1983. Owing to the stringent specifications written into the contract, it was not until August 26 that various technical problems were solved and production flying could begin. The surveys over the 2 selected areas were completed on October 25. A total of 17 000 line-km were flown at a spacing of 200 m. The data are now being processed and the final format of the results is being decided. The system shows improvement in 2 aspects. Firstly, by reducing the integration time to .25 seconds, Kenting Earth Sciences Limited has increased the resolution to such an extent that structures 87 m apart can be resolved. Secondly, the company has rebuilt its compensator which automatically corrects for variations in pitch, yaw and roll of the aircraft. The automatic compensation can be set up in ½ hour.

Riley (1983) continued the assessment of the peat resources in Eastern Ontario under the Hydrocarbon Energy Resources Program (HERP). The Ottawa-St. Lawrence Lowlands area was to be inventoried at a scale of 1:250 000.

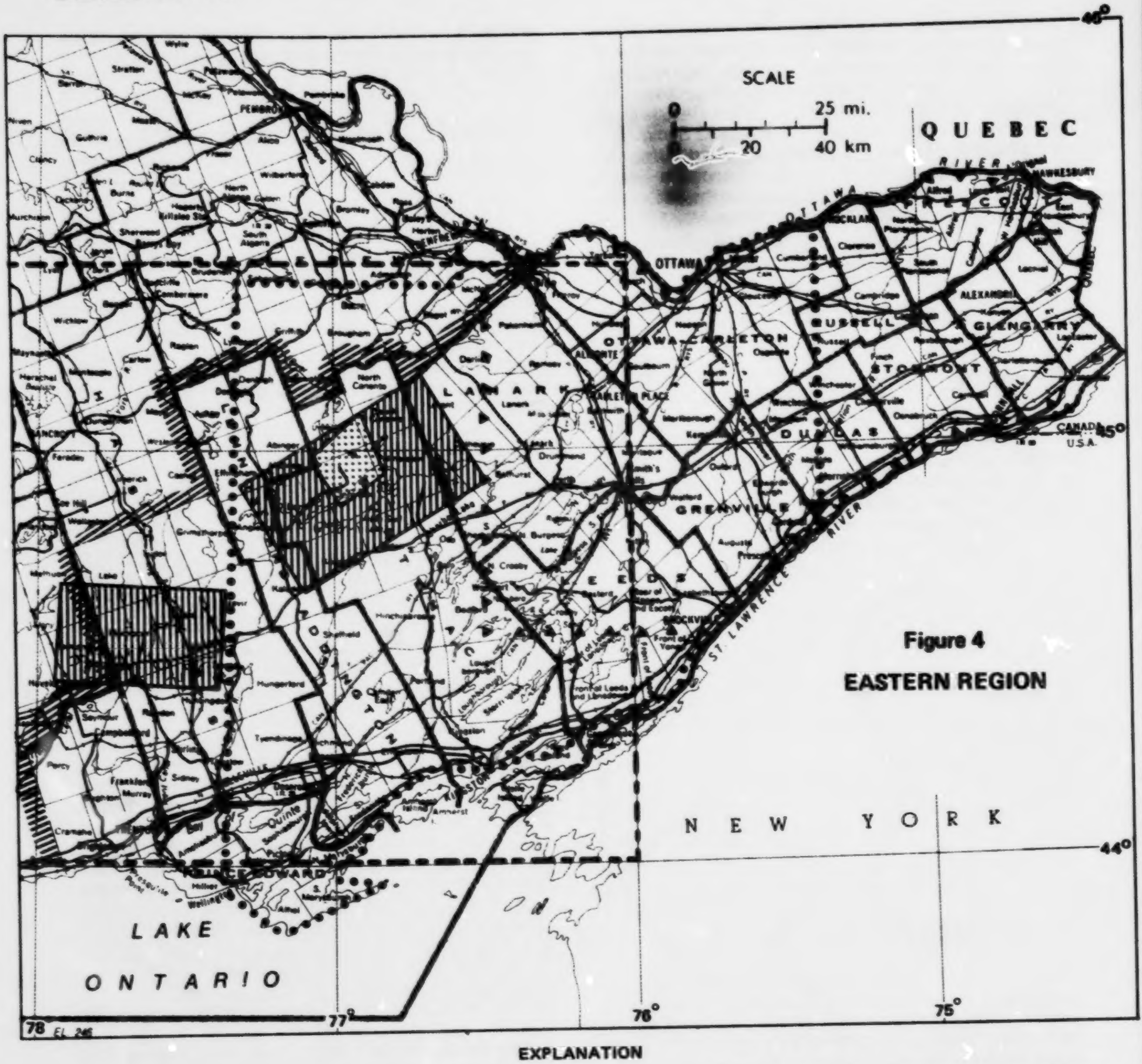
SCALE
0
25 mi.
0
20
40 km
QUEBEC
OTTAWA RIVER
OTTAWA
PEMBROKE
OTTAWA-CARLETON
LANARK
RUSSELL
GLENGARRY
STORMONT
DUNDAS
GRENVILLE
LEEDS
PRESCOTT
HAWKESBURY
ALEXANDRIA
CARLETON PLACE
BROCKVILLE
KINGSTON
PRINCE EDWARD
Quinte
ST. LAWRENCE RIVER
NEW YORK
LAKE ONTARIO
CANADA
U.S.A.
46°
45°
44°
78
77°
76°
75°
EL 246

Figure 4
EASTERN REGION

EXPLANATION

▶ ▶ Paleozoic Rock Mapping (Williams and Rae 1983)
Development of a Commercial Aeromagnetic Gradiometer (Barlow 1983); test-flying survey areas
░ Questor Surveys Limited
▥ Kenting Earth Sciences Limited

— — — Assessment of Peat Resources in the Ottawa-St. Lawrence Lowlands Area (HERP) (Riley 1983)

● ● ● ● ● Study of Mineral Occurrences in the Southern Part of the Grenville Province Dillon (1983 a,b) and Barron (1983)

▨ Boundary of Resident Geologist's Area

Dillon (1983a, 1983b) and P.S. Barron (1983) completed a study of mineral occurrences in the southern part of the Grenville Province.

## Geological Mapping, Eastern Region Resident Geologist's Office

The first draft of the Madoc Township map has been completed. The final map and report will be completed by the end of March 1984.

The compilation Geology and Mineral Deposits Map of Kingston, Ontario, sheet (NTS 31 C), is now in press. The map is to be published as a preliminary map (scale 1:125 000) in early 1984.

W.T. Grant and C.P. Verschuren have completed a preliminary investigation of sillimanite in the Clarendon area. A report along with a final map will be published in March 1984.

A section of the Clare River Syncline was mapped last fall, and a final map was produced. The report along with this map will be published in March 1984.

## Drill Core Library

Construction of the core storage facility, located approximately 2 miles north of Tweed, began in late October 1983. The building is scheduled for completion early in the spring of 1984. Construction of the building is funded through the Government of Ontario Board of Industrial Leadership and Development.

The Drill Core Library will provide a permanent repository of physical data which will reduce the overall cost of exploration and research to the private sector, and to the Ministry, by reducing the need to re-explore and redrill specific areas of geological interest. It will also be useful in formulating new geological concepts and exploration models which will stimulate mineral exploration in the search for new mineral deposits.

## Mineral Education Program

The McChesney Lake Junior Rangers were taken on a field trip to Canada Talc Mines Limited and to several other mineral prospects in the vicinity of Tweed. A tour was also arranged through the plant and quarry of Steep Rock Resources Incorporated, Calcite Division, for the Park Lake and Murphy's Point Junior Rangers.

Geology talks and slide shows were presented at 2 schools in the Napanee and Belleville areas. A talk was also given at the St. Lawrence Islands National Park. A field trip was organized for a group of boy scouts near Thomasburg. In cooperation with the Kemptville information officer, a display was set up at the gem show in Ottawa sponsored by the Lapsmith Club.

## Geotechnical Engineering Program

The Regional Mines Coordinator and his staff continued the geotechnical program. This program included mapping of sensitive clay areas, promoting public awareness of landslides and landslide hazard lands, providing consultations on site and by telephone for specific sites, and liaison with municipalities and conservation authorities.

A new publication, "Slope Stability of the South Nation River and Portions of the Ottawa River" (Poschman *et al.* 1983), was released in late 1983 (Figure 3). This report and accompanying maps provide factors of safety for slopes along the South Nation River Watershed, as well as the Ottawa River.

One thousand copies of the brochure "Landslides in Eastern Ontario" (Ontario Ministry of Natural Resources, Eastern Region 1983) were produced, and are now being distributed by Ontario Ministry of Natural Resources offices, conservation authorities, and municipalities, to promote public awareness of landslide hazards.

North Plantagenet Township is presently incorporating an engineered setback in their zoning bylaws to restrict landowners from building too close to the proximity of unstable slopes.

Alfred Township enacted a bylaw to ensure that building permits in landslide hazard areas are issued subject to completion of a geotechnical study and any necessary slope stabilization work.

Geotechnical staff carried out field investigations along the Ottawa, Mississippi, and Madawaska Rivers. The resulting information was used to upgrade slope stability data that is presently on file in the Regional Mines Coordinator's office in Kemptville. Reports on these areas are to be published in the spring of 1984.

## Urban Geology

An unpublished urban geology map at 1:10 000 scale was produced for the City of Cornwall (Kessel-Taylor *et al.* 1983) (*see* Figure 3). The objective was to concisely describe the general land surface conditions in the city for use in determining the construction and resource capabilities of different areas.

Data for 400 drillholes listed in the city's geotechnical files was combined with data from 525 water well logs, published geological information, air photo interpretation, and limited field work including EM 31 geophysical lines, to produce the map and report.

The work was carried out by Ontario Ministry of Natural Resources staff; information was provided by geotechnical consulting firms and the city's Department of Engineering Services.

An important part of this project was to determine whether urban geology reports would be useful to planning agencies, construction companies, and engineering firms. To determine this, approximately 30 questionnaires were distributed. The response was favourable from 23 questionnaires that were returned.

## Karst Features

A preliminary literature survey of karst features was carried out in southeastern Ontario in order to determine if they were a potential hazard (Kessel-Taylor 1983). It was found that Paleozoic limestones of the Trenton and Black River Groups, as well as Precambrian marble were the most susceptible to karst processes. A total of 24 karst and possible karst features were identified from the literature search.

## Pits and Quarries—Napanee and Tweed Districts[1]

The Resident Geologist's Office at Tweed provided input, consultation, and reviewed proposed mineral resources policies in conjunction with the Mineral Resource Supervisor in Napanee for the following:

a) County of Hastings Official Plan
b) County of Lennox and Addington Official Plan

In addition, the Mineral Resources staff in Napanee commented on numerous severances and zoning bylaw amendments affecting mineral resource lands for the following townships:

Brighton
Cramahe
Hallowell
Hungerford
Marmora
Murray
Percy
Rawdon
Seymour
Sidney
Storrington

Table 3 shows the distribution of licenced pits and quarries in those townships that are designated under the Pits and Quarries Control Act. A total of 56 townships are under the administrative responsibility of both districts, with 26 geographic townships being designated under the Act.

Tables 4 and 5 give the reported production figures for licenced operators in designated areas.

**TABLE 3** **LICENCED PITS AND QUARRIES IN NAPANEE AND TWEED DISTRICTS***

| District | Licenced Quarries | Licenced Pits | Licenced Quarries and Pits |
|---|---|---|---|
| Napanee | 36 | 132 | 3 |
| Tweed | 11 | 54 | 1 |
| TOTALS | 47 | 186 | 4 |

*Only a portion of both Napanee and Tweed Districts are designated under the Pits and Quarries Act.

**TABLE 4** **REPORTED AGGREGATE PRODUCTION BY TOWNSHIP FROM LICENCED OPERATORS IN NAPANEE DISTRICT UNDER THE PITS AND QUARRIES CONTROL ACT**

| Township | 1980 Tonnes | 1981 Tonnes | 1982 Tonnes |
|---|---|---|---|
| Ameliasburgh | - | 60,036 | 20,324 |
| Athol | - | 40,801 | 49,824 |
| Brighton | 156,215 | 197,780 | 266,578 |
| Cramahe | 1,946,113 | 1,584,672 | 1,275,435 |
| Hallowell | 46,036 | 45,918 | 19,324 |
| Hillier | - | 19,737 | 42,301 |
| Kingston | 470,987 | 498,984 | 592,636 |
| Murray | 424,232 | 343,251 | 263,683 |
| North Marysburgh | - | 1,745 | 2,421 |
| Percy | 95,200 | 77,138 | 47,567 |
| Pittsburgh | 196,587 | 161,848 | 118,657 |
| Rawdon | 23,163 | 8,902 | 18,058 |
| Seymour | 139,492 | 148,234 | 139,230 |
| Sidney | 246,639 | 469,407 | 342,686 |
| Sophiasburg | - | 560,394 | 1,226,317 |
| South Marysburgh | - | 3,223 | 1,740 |
| Thurlow | 326,450 | 192,852 | 97,370 |
| Tyendinaga | 86,272 | 144,085 | 132,466 |
| TOTALS | 4,157,386 | 4,559,007 | 4,656,617 |

N.B. The 1981 totals for Townships of Ameliasburgh, Athol, North Marysburgh, South Marysburgh, Hillier and Sophiasburgh are for the second half of that year.

---

[1] by S. Thatcher, Mineral Resource Supervisor, Napanee District

## Inactive Hazardous Mine Site Inventory

The inactive hazardous mines inventory was initiated in August of 1983. The purpose being to establish if a site is hazardous and take the necessary steps to correct the hazard, i.e. fencing, capping, and/or filling. A total of 292 properties were identified out of which 221 where investigated and rated as good, fair, poor, bad, and very bad. The Resident Geologist, Regional Mines Engineer, and the Mineral Resource Supervisor of Napanee have inspected the majority of sites rated as bad to very bad and approved the necessary remedial work. At the time of writing, 5 sites were tendered out on 2 properties for remedial work which included fencing 1 shaft, 2 trenches, and 2 test pits in Bedford and Loughborough Townships (*see* Table 6).

## Abandoned Pits and Quarries Study

In the summer of 1982 and 1983, an abandoned pit and quarry study was undertaken by the Napanee District Mineral Resources section. The study was to locate and describe briefly the Quaternary and Paleozoic geology. The sites were then rated as: (a) depleted, (b) moderate, (c) substantial reserves.

Table 7 shows the number of townships inventoried to date.

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**TABLE 5** REPORTED AGGREGATE PRODUCTION BY TOWNSHIP FROM LICENCED OPERATORS IN TWEED DISTRICT UNDER THE PITS AND QUARRIES CONTROL ACT

| *Township | **1981 Tonnes | 1982 Tonnes |
|---|---|---|
| Elzevir | 6,963 | 1,830 |
| Grimsthorpe | - | - |
| Hungerford | 86,507 | 161,715 |
| Huntingdon | 43,645 | 98,185 |
| Lake | 761 | 333 |
| Madoc | 15,711 | 31,605 |
| Marmora | 10,451 | 22,303 |
| Tudor | - | - |
| TOTALS | 164,038 | 315,971 |

*Denotes geographic townships.

**The 1981 totals are for the second half of that year, (July 1 - December 31).

**TABLE 6** INACTIVE HAZARDOUS MINE SITE INVENTORY – NAPANEE AND TWEED DISTRICTS

| Napanee District Townships | Shafts | Trenches | Pits |
|---|---|---|---|
| Bedford | 22 | 3 | 43 |
| Loughborough | 8 | 1 | 17 |
| Portland | - | 1 | 3 |
| Storrington | 1 | - | - |
| Totals | 31 | 5 | 63 |
| Tweed District Townships | Shafts | Trenches | Pits |
| Barrie | 9 | 4 | 8 |
| Camden East | - | 1 | - |
| Elzevir | 3 | - | - |
| Grimsthorpe | 1 | - | - |
| Hinchinbrooke | 6 | 3 | 13 |
| Hungerford | 2 | - | - |
| Huntingdon | 27 | 5 | 10 |
| Kaladar | 1 | - | 4 |
| Kennebec | 2 | 1 | 3 |
| Lake | 2 | - | 3 |
| Madoc | 33 | 16 | 22 |
| Marmora | 17 | 1 | 11 |
| Olden | 4 | 2 | 20 |
| *Oso | - | - | 6 |
| *Palmerston | - | - | 1 |
| *Tudor | 2 | - | - |
| Totals | 109 | 33 | 101 |
| Grand Totals | 141 | 38 | 164 |

*Not yet completed or inventoried at the time of writing this report.

TABLE 7 | ABANDONED PITS AND QUARRIES STUDY

| Township | County | Pits | Quarries |
|---|---|---|---|
| Abinger | Lennox & Addington | 10 | - |
| Adolphustown | Lennox & Addington | 4 | 1 |
| Amherst Island | Lennox & Addington | - | 2 |
| Anglesea | Lennox & Addington | 16 | 1 |
| Ashby | Lennox & Addington | 1 | - |
| Brighton | Northumberland | 48 | - |
| Cramahe | Northumberland | 32 | - |
| Camden East | Lennox & Addington | 29 | 10 |
| Effingham | Lennox & Addington | 8 | - |
| Ernestown | Lennox & Addington | 18 | 29 |
| Kaladar | Lennox & Addington | 24 | - |
| Murray | Northumberland | 27 | 3 |
| N. Fredericksburgh | Lennox & Addington | 7 | 9 |
| Percy | Northumberland | 35 | - |
| Rawdon | Hastings | 28 | 1 |
| Richmond | Lennox & Addington | 12 | 5 |
| Seymour | Northumberland | 35 | 1 |
| Sheffield | Lennox & Addington | 39 | - |
| Sidney | Hastings | 49 | 1 |
| S. Fredericksburgh | Lennox & Addington | 6 | 9 |
| Storrington | Frontenac | 35 | 15 |
| Thurlow | Hastings | 19 | 1 |
| Tyendinaga | Hastings | 36 | 3 |
| TOTALS | 23 | 518 | 91 |

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# Report of Activities 1983
# Central Region Geologist Area, Central Region

**Mahendra Narain[1] and Jackie Brand[2]**

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## Introduction

The Regional Geologist's Office at Richmond Hill and the 5 District Offices at Cambridge, Midhurst, Lindsay, Maple, and Fonthill continued to administer programs which provided geoscience information and consultative services to various government agencies, private consulting firms, the aggregate industry, prospectors, and the general public.

There has been an increase in requests for consultative services and geoscience information, especially from the general public. Many inquiries originated in the United States.

The Regional mineral resources library is becoming more versatile with the latest addition of microfiche files, reader, and printer facilities. Most of the former Ontario Division of Mines and Ontario Geological Survey publications are now available on microfiche. All microfiched publications have been catalogued and indexed and can be obtained upon request. New and updated material has been added to the library. All interested parties are invited to use both these facilities.

Aggregate production in the Region was once again on the decrease with 1982 production being the lowest in years. In 1982, production was recorded at 45.7 million tonnes, about a 22% drop from 58.3 million tonnes in 1981. The number of licensed pits and quarries totalled 868 in 1983, a slight decrease from 1982.

Three gypsum mines in the Region continued their operations and increased production and manpower over last year.

The Regional Geologist administered programs related to geoscience information services, data gathering, and mineral resource management; and provided technical directions and support for the district geological-mineral resource programs.

Current staff at the Central Region Office includes: Lloyd Thompson, Regional Mines Co-ordinator; Jackie Brand, Resource Geologist; Georgina Pearson, Mineral Resources Secretary. Geological Staff at the 5 District Offices includes: Ted Harvey (Cambridge); Dennis Billings (Lindsay) who left the Ministry in November; John Fraser (Niagara); Amar Mukherjee (Maple); and Bill Fitzgerald (Huronia).

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[1] Regional Geologist, [2] Resource Geologist, Ontario Ministry of Natural Resources, Central Region.

# Regional Geologist's Activities

## Resources and Land Use Planning

The District Strategy exercise is now complete after several reviews and changes. These documents have been printed in a final form as guidelines. All Districts are now in the process of explaining and implementing these guidelines. Several changes were made to mineral resources data as a result of public and concerned groups input. The Ontario Ministry of Natural Resources' input to the Niagara Escarpment planning process was limited to a review of documents leading up to Cabinet submission. The Cabinet is expected to complete its review in the new year.

A large part of the Regional Geologist's time was spent in coordinating and initiating several mineral resource studies in the Region and attending Ontario Municipal Board hearings. An evaluation of the depositional characteristics of Whirlpool Sandstone resources was continued during the year by Peter Martini of Guelph University. This will help delineate suitable areas for industrial exploitation. A report on mineral inventory of the Central Region by G.R. Guillet, a consulting industrial minerals specialist, is now available as Open File Report 5431 (*see* Appendix 1). Visits were made to geologically significant sites identified by Regional Parks staff, and to other areas of geological interest. The Regional Geologist participated in 2 complete audits of the Districts. The following is a list of some of the geological and mineral resources inputs that were made by the Regional and District staff.

Region of Niagara
Towns of Arthur, Oakville, Milton, Ancaster, Glanbrook
City of Waterloo
City of Brampton
City of Oshawa
Newcastle, Hope, and Cavan Townships
Balsam Lake Provincial Park Master Plan

## Consultation and Educational Services

The Regional Office at Richmond Hill and 5 District Offices at Cambridge, Midhurst, Lindsay, Maple, and Fonthill continued to provide consultation related to geology and mineral resources legislation. There is a renewed interest in mineral rights, prospecting, and claim staking procedures. The Regional Office received several inquiries on the status of old mining companies. Many of these were from people in the United States. The District staff have continued making inputs to the Aggregate Sources List of the Ontario Ministry of Transportation and Communication.

The usual public and consultant services were provided to: the Ministries of Transportation and Communications; Housing; Labour; and Conservation Authorities; Ontario Hydro, local/regional municipal governments, and the Niagara Escarpment Commission. The nature of consultations included mineral resources potential, oil and gas potential, identification of rock and mineral samples, claim staking, water table problems, and the availability of geological and mining literature. There was increased interest by students who wanted mineral commodities information and assistance in preparation of project reports relating to mines and geology. Several inquiries related to proposed mineral resources legislation, the Mining Tax Act, and the Ontario Mineral Exploration Program (OMEP) were also received. Many inquiries received were related to mineral tax incentives offered by the Province of Ontario, including some from the United States and Alberta.

## Pits and Quarries

Input to and review of proposed mineral policies of the municipalities and other related matters were provided by the Regional Geologist. New mineral aggregate resource planning policies are now being implemented by the Region and the Districts.

## Property Examinations

The Regional Geologist, along with District staff, examined sandstone areas identified in Maple and Cambridge Districts. The District geologists have been involved in the field examination of both licensed and unlicensed aggregate resource areas as part of District strategies and planning inputs. Areas of Whirlpool Sandstone deposits under study by Peter Martini were also examined by the Regional Geologist, and the Cambridge and Maple District Geologists. Site visits to important projects in the Scarborough and Belmont areas were also made.

# Geology and Mining Related Activity

The Central Region retains its status as the largest producer of structural materials in Southern Ontario. These structural materials include sand, gravel, shale, limestone, dolostone, granite, and sandstone. Gypsum mining in the Region improved over last year. Canadian Gypsum Company Limited increased their manpower from 40 to 55 workers. Domtar Construction Materials Limited has 66 workers. Both companies have changed their production cycles from 2 shifts to 3 shifts. Westroc Mines Limited has 18 workers. All 3 companies report increases in production. The gypsum production in the Region was over 900 000 million tons. The Ministry's recent publication of "Peat and Peatland Evaluation of the Peterborough Area" (OFR 5448, *see* Appendix) has generated some interest in peat as an alternative energy source and has expanded use for horticultural purposes.

Renewed activity continued at the Cordova Gold Mine in Belmont Township.

The number of licenced pits and quarries in the Central Region remained about the same as in 1982, with 868 in 1983 as compared with 869 last year (see Table 1). However, the overall production for the Region in 1982 showed a significant decline of about 22% from the previous year. The depressed economic health of the construction industry and increased transportation costs are blamed for this situation.

The granite quarry in Belmont Township, operated by Fairmont Granite Limited, experienced operational problems due to increasing fractures with depth. The adverse geological conditions have forced the company to cease operations at the Belmont Quarry, though other building stone (granite) properties in the province are operated by it on a demand basis.

Following are highlights reported by some of the pit and quarry operators, and the consulting firms operating within the Central Region. This information is supplied by the respective companies.

## Port Colborne Quarries Limited, Port Colborne

The company reported:

*The 1983 operation highlights are minor in scope due to a reassemblance of operations after an eleven month strike.*

*A contract agreement was secured in late April 1983 at which time we commenced operations.*

*Domestic markets from April to November in the Niagara Peninsula have been sparse. Our export market to the U.S. has been extremely competitive. The market is also extremely soft with no sure or sound future for 1984.*

**TABLE 1** | **LICENCED PITS AND QUARRIES IN CENTRAL REGION**

| DISTRICT | LICENCED QUARRIES | LICENCED PITS |
|---|---|---|
| Cambridge | 27* | 198* |
| Huronia | 9* | 180* |
| Lindsay | 14* | 254* |
| Maple | 10* | 142* |
| Niagara | 18* | 15* |
| TOTAL | 78 | 790 |
| TOTAL LICENCED PROPERTIES | 868 | |

*verified by Districts

## Walker Brothers Quarries Limited, Niagara Falls

The company reported:

*Walkers Brothers Quarries is a limestone surface quarry located on the corner of Mountain Road and Thorold Townline Road in Niagara Falls.*

*We presently employ 18 personnel which are directly related to the production of crushed stone. As of the end of October we have produced approximately 550 000 tonnes. We plan to produce until December 15th which should give us a yearly production of approximately 650 000 tonnes. We operate three extraction faces ranging from 20 to 40 feet in height. We have made no major changes in our production system. We are experiencing a 25% drop in sales as compared to 1982. This is due to significantly depressed market conditions in our area.*

## Vineland Quarries and Crushed Stone Limited, Vineland

Vineland Quarries and Crushed Stone Limited is a limestone surface quarry located on the corner of Fly Road and Regional Road Number 24 in Vineland. The company reported:

*We presently employ 11 personnel which are directly related to the production of crushed stone. As of the end of October we have produced approximately 480 000 tonnes. We plan to produce until December 15th which should give us a yearly production of approximately 550 000 tonnes. We operate one extraction face ranging from 20 to 30 feet in height. We have made no major changes in our production system.*

*We are experiencing a 30% drop in sales as compared to 1982. This is due to significantly depressed market conditions in our area.*

## Steed and Evans Limited, Kitchener

The company reported:

**Bridgeport Pit Licence #46:**

*The 17 acres reported last year has now been seeded into a grain crop this fall. Further rehabilitation has been going on and a new road has been completed into our picnic area.*

**Heidelberg Pit Licence #528:**

*Work has continued on the two berms that were reported last year.*

**Fonthill Pit Licence #195:**

*The 4 fairways are now completed and opened to some extent to the public. A large number of mature trees were moved from different locations and planted on these four new fairways.*

*In regards to our pit extension, nothing new has been resolved, but, we are still trying.*

*The economic situation is still hurting, but we are hoping that in 1984-1985 things will turn around in the building and construction industries.*

## Armbro Aggregates, Brampton

The company reported:

*The following is a brief overview of our operations in the Region of Peel/Metropolitan Toronto area.*

*Armbro runs two gravel operations in the area; one in Brampton and one in Caledon. We employ approximately 38 production workers and a supervisory/administration staff of 12 people.*

*Armbro is currently involved in production at only the Caledon Pit where production this year totalled 1 564 403 tons of marketable materials. Our sales for 1983 will top the 2.2 million ton mark. About 69% of the year's sales total is made up of the supply materials to Asphalt and Ready-Mix concrete plants.*

*Our strong market share has decreased proportionately, with the slowed economy in the past four years, due to less home starts and road construction. There has been an upswing in material sales due to increased construction activity in the third quarter this year, and the focus of the industry will be shifted in part to numerous large scale road construction projects that have been tendered for 1984-85.*

## Franceschini Brothers Aggregates Limited, Mississauga

The company reported:

*As year end closes in, we find this years' volume (sales and dollars) slightly ahead of last year, although profitability has dropped percentage wise. Considering 1981 levels we continue to be down dismally on all aspects. We anticipate the coming year will run parallel with 1983. There really is little sign of recovery and with that in mind any major expansion of equipment is doubtful. Currently we employ 29 full time staff excluding the executive.*

*We do intend in 1984 to apply for expansion of a licenced pit we now operate within the Town of Caledon. The success of this application is essential. The property contains large quantities of fine clean sand, not common to our present operations, and this particular type of sand is critical in the manufacturing of high quality H.L. Sands for asphalt.*

*We look forward to 1984, as we hope the economay does in fact improve and profitability returns, however we must approach it with extreme caution and continued restraints.*

## Steetley Industries Limited, Hamilton

The company reported no change in operations from last year.

## St. Marys Cement Company, Bowmanville

The St. Marys Cement Company operates a cement plant and a limestone-shale quarry near Bowmanville. The Company facilities are located immediately south of Highway 401 at Waverley Road.

Due to the slightly improved economic climate and an upturn in construction, the cement plant has been operating at 80% of its rated capacity for the year of 1983. Most of the cement is shipped by bulk tank truck, some by rail. The company is also shipping clinker by boat to its plants in Wyandotte, Michigan, and Milwaukee, Wisconsin. About one quarter of St. Marys Cement Company's total production is shipped to the United States. Most of the remaining production is shipped to the Metropolitan Toronto market.

The company presently employs 120 personnel at its Bowmanville plant.

## Golder Associates, Mississauga

Golder Associates is an international consulting company providing comprehensive services in geoengineering, primarily in the fields of energy, natural resources, transportation, civil, and offshore engineering.

In the Central Region, Golder Associates is involved in the following projects for the mining and extractive industries.

(1) A full range of services are being provided to Domtar Construction Materials Limited at their Caledonia gypsum operations. These include:

- planning and layout of an exploration program
- geological/geotechnical interpretation
- short and long term mine planning
- scheduling
- service and equipment requirements.

(2) A geological investigation including a drilling program has recently been undertaken to assess the reserves available in a dolomite quarrying operation.

(3) Golder Associates has been retained by Steetley Industries to carry out a hydrogeological investigation of the Dundas Brow Landfill Site. The site is located on the edge of the Niagara Escarpment and has received primarily inert industrial wastes. The investigation includes cored holes up to 60 m in length through different rock formations beneath the landfill, and the installation of multi-level piezometers.

## C. Mirza Engineering Incorporated, and H.H. Angus and Associates, Downsview

These companies are involved in a unique multi-technical geological and engineering project called "Aquifer Thermal Energy Storage Demonstration Project for Public Works Canada, Ontario Region, in Scarborough, Metropolitan Toronto". C. Mirza Engineering Incorporated provided the following description of the project:

*Subtask VII of the International Energy Agency of the OECD Nations has as its mandate the development of Solar Technology. One of the off-shoots of this subtask is the storage of energy on a seasonal basis in naturally occurring underground water bodies known as aquifers.*

*During the preliminary design stages of a $40 000 000 Government of Canada building in Scarborough, Ontario, such an aquifer was detected at a depth of 50 metres. It was decided by the project management team to set up an investigation and instrumentaton program to study the feasibility and performance of Aquifer Thermal Energy Storage (ATES).*

*The studies to date on this project have included hydrogeological investigations of the aquifer, and an assessment of the geology of this particular area of Scarborough whose Bluffs on Lake Ontario have been a subject of interest and study to many geologists in the past.*

*ATES in principle consists of the pumping of groundwater at its ambient temperature, the modification of that temperature by heat exchange (either cooling or heating), and the reinjection of the water with modified temperature back into the aquifer from whence it came. The reinjected water is stored until seasonal cooling or heating demands necessitate its withdrawal in the quantities required for heating and airconditioning purposes.*

*Problems associated with withdrawal and reinjection of groundwater are chemical and biological changes, geochemical modifications, and physical loss of efficiency of the mechanical systems with time due to well screen clogging, and the like.*

*At the Scarborough site, four large diameter (356 mm) gravel packed wells will be installed, along with over 14 observation wells for instrumentation purposes. Research is currently underway to select the appropriate instrumentation for measurements of groundwater pressures and ground temperatures once the system is put into operation. One complication not anticipated in the earlier studies is the occurrence of methane gas from the Scarborough formation which constitutes the main aquifer for this project.*

*The research funding for the project is being provided by the Energy Technology Branch of Public Works Canada, Ottawa. Senior Project Manager for Public Works Canada is M.J. Kitchen.*

## Gartner Lee Associates Limited, Markham

Gartner Lee Associates Limited has been investigating the geologic and hydrogeologic conditions in southern Ontario for the Ontario Waste Management Corporation. The Corporation is a provincial Crown Corporation which has the responsibility of establishing treatment and disposal facilities for hazardous and liquid industrial wastes in Ontario. The geologic review is designed to provide a basic framework for hydrogeologic interpretation which is part of the overall environmental assessment being carried out by the Corporation.

The first phase of this geologic overview has been completed and is available to the public (O.W.M.C. 1982a, 1982b; Cooper *et al.* 1983). It consists of a broad review of the geology of southern Ontario south of the 46th parallel.

A second, more detailed, review of the geology of the "Golden Horseshoe" area of Ontario is presently being completed. This review covers the Whitby-Toronto-Brampton-Milton area (the Halton Till Plain) and large parts of the Niagara Peninsula (the Lake Iroquois Plain and the Haldimand Clay Plain). A 2-part report describes both the surficial and subsurface geology as it is known from the presently published literature. The text reviews the geologic properties of the Quaternary units of the area and draws together information presented in many geologic studies.

# Staking and Exploration Activity

Staking activity was on the increase in 1983 with 17 new mining claims recorded in Belmont Township, bringing the total to 20. No assessment work, however, was filed for unpatented mining claims. Six Licences of Occupation were forfeited and have been re-opened for staking.

Lasir Gold Incorporated has restaked 4 old mining claims and 8 of the new claims just west of Cordova Mines. Walter Hood, president of Lasir Gold Incorporated, reports (D. Billings, Ontario Ministry of Natural Resources, Lindsay District, personal communication, 1983) that the company is assessing the entire property geologically and geophysically. An evaluation of a process which may lead to economical treatment of ore is also being carried out with particular emphasis being placed on low capital-cost cyanide leaching techniques. Previous assessment work indicates there are approximately 104 326 tonnes of old mill tailings which have been cleared and prepared for processing. In addition, there are an estimated 36 287 tonnes of oredump tailings at the surface around several of the shafts. Hood reports that work on the infrastructure required to treat ore dumps is taking place. Several ponds have also been built to accomodate the processing facility. There was no gold production in 1983, but the company plans to bring the property into production in 1984.

# Regional Geological Evaluation Projects

## Abandoned Pits and Quarries Studies

All districts have taken steps to reassess abandoned sites with specific objectives of determining possible rehabilitation and after-uses, and estimating possible resources and rehabilitation costs.

## District Strategy

District Strategies were published earlier this year and are on file at the Regional and District Offices.

## Sandstone Resources Study

Stage two of this study is in progress in Maple District of the Region. The study is conducted by Peter Martini of Guelph assisted by James Kwong, a post-graduate

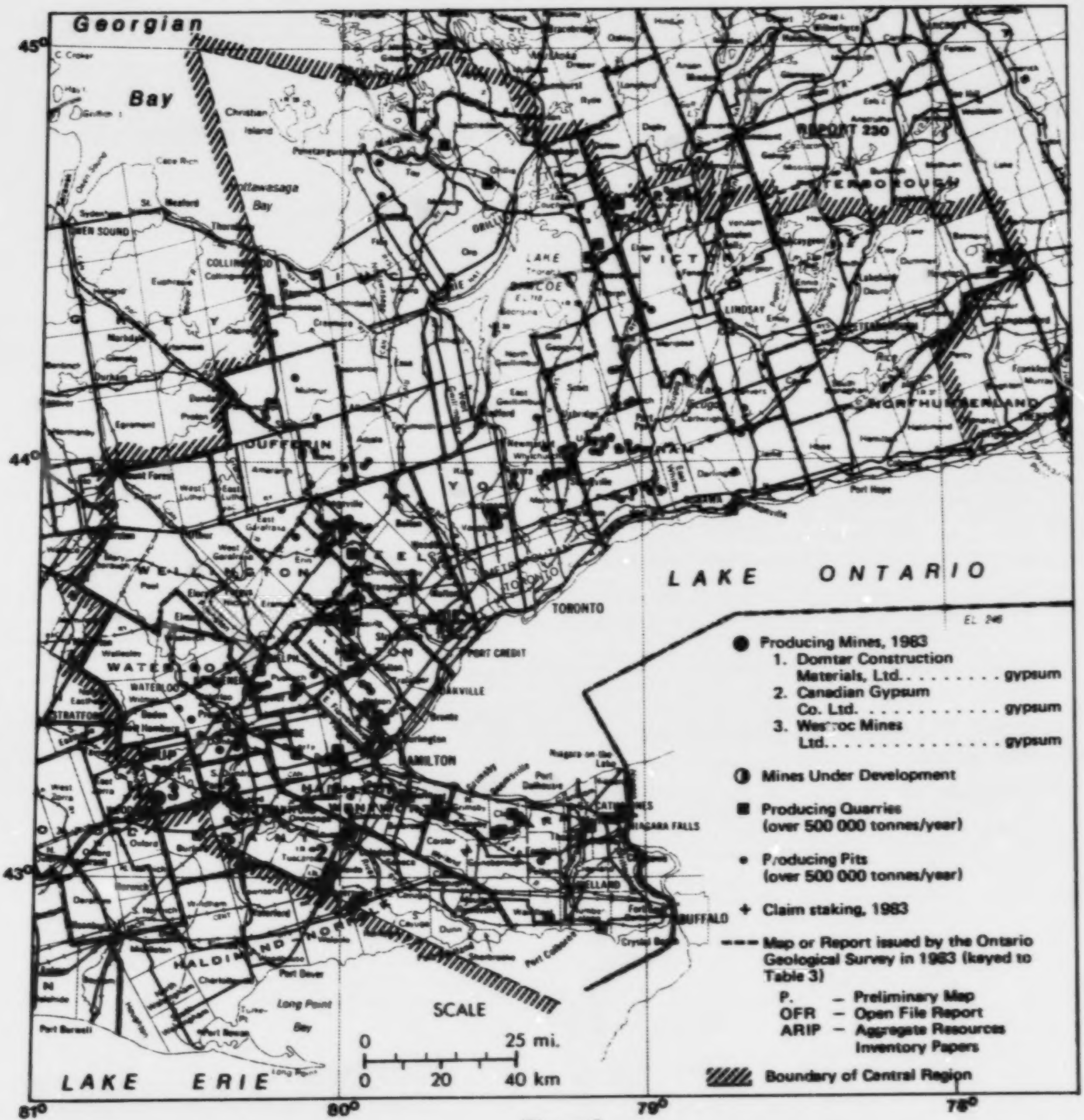
Georgian Bay
Nottawasaga Bay
Christian Island
Lake Simcoe
REPORT 230
PETERBOROUGH
VICTORIA
LINDSAY
NORTHUMBERLAND
DUFFERIN
WELLINGTON
WATERLOO
STRATFORD
HALDIMAND
NORFOLK
OWEN SOUND
COLLINGWOOD
ORILLIA
PETERBOROUGH
METRO TORONTO
TORONTO
PORT CREDIT
OAKVILLE
HAMILTON
Niagara on the Lake
ST. CATHARINES
NIAGARA FALLS
WELLAND
BUFFALO
Port Hope
Port Dover
Long Point Bay
LAKE ONTARIO
LAKE ERIE
EL 246
● Producing Mines, 1983
1. Domtar Construction Materials, Ltd. . . . . . . . . gypsum
2. Canadian Gypsum Co. Ltd. . . . . . . . . . . gypsum
3. Westroc Mines Ltd. . . . . . . . . . . . . gypsum
◑ Mines Under Development
■ Producing Quarries (over 500 000 tonnes/year)
• Producing Pits (over 500 000 tonnes/year)
+ Claim staking, 1983
--- Map or Report issued by the Ontario Geological Survey in 1983 (keyed to Table 3)
P. – Preliminary Map
OFR – Open File Report
ARIP – Aggregate Resources Inventory Papers
▨ Boundary of Central Region
SCALE
0 25 mi.
0 20 40 km
45°
44°
43°
81°
80°
79°
78°

Figure 1
CENTRAL REGION

**TABLE 2 REPORTED AGGREGATE PRODUCTION BY TOWNSHIP FROM LICENCED OPERATIONS IN CENTRAL REGION**

**LINDSAY DISTRICT**

| Township | 1980 | 1981 | 1982 |
|---|---|---|---|
| | Tonnes | Tonnes | Tonnes |
| Alnwick | 49,099 | 61,764 | 58,921 |
| Asphodel | 368,496 | 203,405 | 380,582 |
| Belmont | 359,108 | 228,762 | 366,670 |
| Bexley-Carden | 359,568 | 682,352 | 449,366 |
| Cavan | 51,895 | 85,546 | 42,878 |
| Douro | 101,114 | 20,781 | 37,358 |
| Dummer | 159,272 | 242,632 | 225,442 |
| Eldon | 86,721 | 67,405 | 42,827 |
| Emily | 334,054 | 190,058 | 202,945 |
| Ennismore | 95,665 | 77,266 | 53,884 |
| Fenelon | 465,199 | 652,574 | 289,506 |
| Haldimand | 263,379 | 221,768 | 76,340 |
| Hamilton | 366,016 | 239,981 | 288,694 |
| Harvey | 96,362 | 35,529 | 38,434 |
| Hope | 66,861 | 60,444 | 165,872 |
| Manvers | 1,527,349 | 2,220,546 | 1,644,096 |
| Mariposa | 255,808 | 170,960 | 202,229 |
| Town of Newcastle: | | | |
| Former Tp. cf Clarke | 202,754 | 197,516 | 145,787 |
| Former Tp. of Darlington | 1,158,720 | 936,359 | 803,738 |
| North and South Monaghan | 29,778 | 14,841 | 11,696 |
| Ops | 4,463 | 13,670 | 1,172 |
| City of Oshawa | 18,177 | 5,546 | 8,016 |
| Otonabee | 98,412 | 192,018 | 98,285 |
| Scugog: | | | |
| Former Twp. of Cartwright | 118,638 | 50,234 | 52,161 |
| Former Twp. of Reach | 629,636 | 632,988 | 761,387 |
| Smith | 506,059 | 339,256 | 304,710 |
| Verulam | 420,777 | 160,496 | 87,572 |
| Whitby | 173,437 | 149,212 | 115,306 |
| **TOTALS** | 8,358,809 | 8,153,909 | 7,048,026 |

**NIAGARA DISTRICT**

| Township | 1980 | 1981 | 1982 |
|---|---|---|---|
| Town of Dunnville | 269,686 | 192,487 | 213,400 |
| Town of Fort Erie | 357,271 | 246,631 | 255,000 |
| Town of Haldimand | 960,196 | 1,076,983 | 811,000 |
| Town of Lincoln | 844,910 | 974,586 | 966,900 |
| City of Niagara Falls | 10,527 | 29,605 | 23,800 |
| Town of Niagara-on-the-Lake | 377,262 | 404,159 | 328,700 |
| Town of Pelham | 678,682 | 674,985 | 482,200 |
| City of Port Colbourne | 277,555 | 1,186,396 | 181,770 |
| Township of Wainfleet | 512,080 | 437,720 | 412,900 |
| City of Thorold | 1,037,119 | 828,777 | 698,900 |
| **TOTALS** | 5,325,288 | 6,052,249 | 4,374,570 |

## TABLE 2 CONTINUED

### HURONIA DISTRICT

| Township | 1980 | 1981 | 1982 |
|---|---|---|---|
| | Tonnes | Tonnes | Tonnes |
| Adjala | 657,294 | 605,828 | 552,880 |
| Amaranth | 34,621 | 59,218 | 117,666 |
| Essa | 34,038 | 40,582 | 23,074 |
| Flos | 169,481 | 128,299 | 152,895 |
| East Garafraxa | 264,603 | 358,334 | 71,927 |
| West Gwillimbury | 20,978 | 40,411 | 21,790 |
| Innisfil | 220,669 | 228,200 | 131,381 |
| Mara | 610,970 | 919,874 | 587,903 |
| Matchedash | 4,940 | 3,944 | 4,719 |
| Medonte | 178,901 | 588,907 | 374,445 |
| Melancthon | 37,923 | 39,217 | 47,239 |
| Mono | 638,355 | 574,352 | 301,171 |
| Mulmur | 49,673 | 24,495 | 55,109 |
| Nottawasaga | 269,653 | 229,582 | 195,404 |
| Orillia | 1,902,071 | 2,043,185 | 1,752,749 |
| Oro | 389,247 | 440,642 | 474,913 |
| Rama | 83,284 | 50,005 | 272,209 |
| Sunnidale | 269,037 | 233,937 | 234,249 |
| Tay | 595,976 | 471,265 | 297,053 |
| Tecumseth | 51,744 | 57,793 | 42,036 |
| Tiny | 240,256 | 182,259 | 137,004 |
| Tosorontio | 73,428 | 80,871 | 66,311 |
| Vespra | 341,644 | 318,556 | 284,949 |
| **TOTALS** | 7,138,786 | 7,719,756 | 6,199,074 |

### MAPLE DISTRICT

| | | | |
|---|---|---|---|
| Brock | 1,129,096 | 1,167,027 | 998,490 |
| Pickering | 401,330 | 359,652 | 388,879 |
| Uxbridge | 3,311,433 | 3,642,328 | 2,402,183 |
| East Gwillimbury | 131,120 | 201,752 | 122,515 |
| East York | 81,674 | 94,599 | 69,328 |
| Georgina | 342,338 | 298,627 | 214,843 |
| King | 276,605 | 272,276 | 159,827 |
| Markham | - | - | - |
| Richmond Hill | 115,475 | 575,296 | 329,795 |
| Vaughan | 974,600 | 327,311 | 436,203 |
| Whitchurch-Stouffville | 3,084,030 | 2,692,770 | 2,512,166 |
| Brampton | 1,690,587 | 1,657,559 | 820 419 |
| Caledon | 4,741,840 | 4,547,395 | 3,897,251 |
| Mississauga | 586,314 | 363,904 | 281,326 |
| **TOTALS** | 16,866,442 | 16,200,496 | 12,633,425 |

**TABLE 2 CONTINUED**

**CAMBRIDGE DISTRICT**

| Township | 1980 | 1981 | 1982 |
|---|---|---|---|
| | Tonnes | Tonnes | Tonnes |
| City of Brantford | - | 601,759 | 334,080 |
| Brantford Twp. | 1,194,374 | 319,186 | 402,859 |
| South Dumfries Twp. | 29,767 | 29,767 | 43,615 |
| Ancaster | 104,084 | 71,811 | 55,950 |
| Flamborough Twp. | 2,819,814 | 2,582,206 | 2,059,260 |
| Stoney Creek | 456,753 | 460,940 | 311,099 |
| Blenheim Twp. | 124,132 | 107,684 | 117,207 |
| North Dumfries Twp. | 689,285 | 757,053 | 554,525 |
| Wellesley Twp. | 624,516 | 678,662 | 344,773 |
| Wilmot Twp. | 175,691 | 249,595 | 190,068 |
| Woolwich Twp. | 363,079 | 318,648 | 317,193 |
| City of Kitchener | 833,790 | 852,975 | 509,426 |
| *City of Cambridge and West Luther | 34,271 | 16,147 | 84,491 |
| Arthur Twp. | 90,771 | 100,425 | 42,823 |
| Maryborough Twp. | 44,711 | 107,134 | 65,803 |
| Peel Twp. | 1,466 | 40,523 | 25,025 |
| Pilkington Twp. | 296,736 | 264,428 | 287,852 |
| West Garafraxa Twp. | 54,663 | 59,798 | 25,723 |
| Eramosa Twp. | 90,482 | 48,652 | 35,929 |
| Erin Twp. | 104,528 | 197,090 | 310,143 |
| Guelph (City and Township) | 336,966 | 408,952 | 410,830 |
| Puslinch Twp. | 1,646,644 | 1,601,549 | 1,701,671 |
| Burlington | 1,671,114 | 2,391,039 | 1,622,202 |
| Milton | 5,060,370 | 5,588,744 | 3,820,244 |
| Halton Hills | 2,731,228 | 2,250,240 | 1,705,394 |
| East Luther | 27,030 | 31,966 | 39,709 |
| **TOTALS** | 19,606,265 | 20,137,053 | 15,417,894 |

*Totals of two single operators

student. The report on this part of the study is expected to be available as an Open File Report in late 1984.

## Township Aggregate Inventory

The Aggregate Assessment Office of the Ontario Geological Survey has published a total of 44 papers on the Central Region. This year, papers were published for the Town of Halton Hills and Blandford-Blenheim Township. In Maple District, the final drafts for Georgina and East Gwillimbury Townships have been completed and are being reviewed by the Aggregate Assessment Office for final approval.

## Seismic Surveys

This year, seismic field work in the Region was limited to Maple District. Surveys were conducted to delineate potential sandstone resources in the Niagara Escarpment area. Seismic field work was also carried out in Georgina Township on licensed and abandoned sites. Test reflection surveys were carried out in the Bolton and Gormley areas to determine depth to bedrock. One summer Experience '83 student assisted in carrying out these surveys.

## Public Awareness Programs

Lindsay District staff assisted the Browndale School in Peterborough in formulating a geology and mining course. District staff also organized a field trip in Durham Region for 30 Durham Region Board of Education geography teachers. The field trip covered surficial geology and aggregate mining.

The Resources Drilling students at Sir Sandford Fleming College in Lindsay were given lectures on pits and quarries legislation and administration.

A presentation on surficial geology, pits and quarries legislation, and a field trip were given to the Junior Rangers at the Coldsprings Camp.

The Regional Mineral Resources staff held a development day for Regional staff. A tour of selected pits and quarries in Cambridge District was given to create a better understanding and appreciation of mineral resource management and the pits and quarries operations in the Region.

Public awareness programs are an ongoing event and the Ontario Geological Survey staff conducted several events. In February, they held their Annual Mineral Exploration Classes. In April, presentations were given to the Oshawa Rock and Minerals Club and to the Durham Treasure Seekers. York University students were given lectures on the geology of Southern Ontario, and a presentation was also given to a class at Newtonbrook Secondary School. In October and November, the Brampton Rock and Minerals Club, and the Walker Mineralogical Club of Toronto, were also given presentations on rocks and minerals.

Huronia District organized 2 weekend tours for the Local Chapter of the Ontario Naturalists to view and explain local geology at selected sites.

## Summary of Field Work by the Ontario Geological Survey

J.L. Riley carried out detailed mapping, reconnaisance studies, and profiling of some peatlands in the Hearst, Armstrong, Pembroke, and Peterborough areas. This included elevation and depth contour mapping, volume calculations, peatland classification mapping, summary text, and site recommendations. Reports on these studies have been published as Open File Reports and are available on microfiche at the Central Regional Office Library.

M.D. Johnson has been conducting an Oil Shale Assessment Project to evaluate the potential of Devonian Shale and Collingwood Shale as a possible source of petroleum. In Central Region, this project has been restricted to the Toronto and Pickering areas and Nassagaweya Township.

## Geoscience Research Grant Program

U. Brand and J. Terasmae began an investigation to develop a useful geochemical technique for the characterization of glacial tills and their source rocks. When this technique is applied, it can be used to define the origin and source rocks of glacial deposits and provide a stratigraphic correlation of the glacial materials.

J.E. Gale, R.L. Nadon, D.A. McKay, and R.A. Sweezey have completed their study to determine the impact of groundwater, rock property measurements, and *in situ* stress measurements on subsurface mining in the Niagara Escarpment.

J.P. Greenhouse, P.F. Karrow, and R.N. Farvolden have undertaken a project to improve resolution and application of borehole geophysics in interpreting subsurface Quaternary stratigraphy of the Kitchener-Waterloo area.

J.P. Greenhouse and M. Monier-Williams are conducting a gravity survey of the Dundas Buried Valley west of Copetown, Ontario.

TABLE 3 MAPS AND REPORTS PERTAINING TO THIS RESIDENT GEOLOGISTS AREA PUBLISHED DURING THIS YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES

**Ontario Geological Survey Reports**

46 IMR 33
230

**Open File Reports**

OFR 5333 OFR 5431 OFR 5465
OFR 5363 OFR 5448 OFR 5477
OFR 5429 OFR 5463

**Preliminary Maps - Geological Series**

P. 2596
P. 2604
P. 2605

**Preliminary Maps - Data Series**

P. 2591

**Aggregate Resources Publications**

ARIP 46
ARIP 68

**Federal - Provincial Maps**

**Coloured Maps**

CM 2475

**Northern Ontario Engineering Geology Terrain Studies Reports**

**Northern Ontario Engineering Terrain Studies Maps**

**Mineral Resources Branch Publications**

Minfacts Issue IV (French Version)
Booklet: Making the Most of Our Minerals
Rocks and Minerals Information, 1983

**Miscellaneous Papers**

MP 107 MP 114 MP 116
MP 113 MP 115

**Geological Survey of Canada Open File Reports**

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Taylor, James, and Smith, Richard
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1983 19th Forum on the Geology of Industrial Minerals, Guidebook for Field Trips; Ontario Geological Survey, Miscellaneous Paper 111, 48p

# Report of Activities 1983 Southwestern Regional Geologist Area, Southwestern Region

**James W.E. Lau[1], B.H. Feenstra[2], and Debra Parker[3]**

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## Introduction

Personnel of the Southwestern Regional Geologist's Office are responsible for petroleum resources activities within the entire Province of Ontario as well as for the mineral resources activities within the Southwestern Region. Staff are located at 2 offices in London: the Southwestern Regional Office at 1106 Dearness Drive and the Petroleum Resources Laboratory at 458 Central Avenue.

Permanent staff at the Southwestern Regional Office are: P.A. Palonen, Provincial Petroleum Supervisor and Southwestern Region Mineral Resources Co-ordinator; R.M. Rybansky, Reservoir Engineer; E. Habib, Reservoir Engineer; G. Tanton, Geotechnical Engineering Assistant; P. Wright, Administrative Assistant; L.R. Laceby, Senior Map Drafter; I. Cameron, Map Drafter; and J. Nagle, Secretary. Personnel at the Petroleum Resources Laboratory are: James W.E. Lau, Acting Chief Geologist and Southwestern Regional Geologist; B.H. Feenstra, Mineral Resources Geologist; R.A. Trevail, Senior Petroleum Geologist; Cathy Hesselmans, Data Processing Technician; and M. Campbell, Laboratory Technician.

Petroleum Resources Inspectors responsible for enforcement of the Petroleum Resources Act, and the Pits and Quarries Inspectors, responsible for the enforcement of the Pits and Quarries Control Act, are located at the various District Offices.

The 1984 Joint Annual Meeting of the Geological Association of Canada and the Mineralogical Association of Canada is scheduled to be held in London, Ontario between May 14-16, 1984. Technical programs featuring many topical and interesting aspects of earth sciences, and selected field trips offering a comprehensive overview of Ontario geology have been planned. The special session on "The Geology and Resources of the Michigan Basin" within the Technical Program should be of particular interest to the Ontario petroleum industry. Papers focusing on the basin tectonics, Keweenawan rifting, diagnetic history of hydrocarbon-bearing strata, hydrocarbon formation and entrapment, and oil shales have been solicited. A number of prominent researchers have agreed to present papers. R.A. Trevail of the Petroleum Resources Laboratory is co-ordinating and chairing the session on the Michigan Basin. Additional information on this session can be obtained from the Petroleum Resources Laboratory. For further general information of the meet-

---

[1]Acting Regional Geologist, [2]Mineral Resources Geologist, Southwestern Region, Ontario Ministry of Natural Resources, London.

[1]Acting Chief Geologist, [3]Geological Assistant, Petroleum Resources Laboratory, Ontario Ministry of Natural Resources, London.

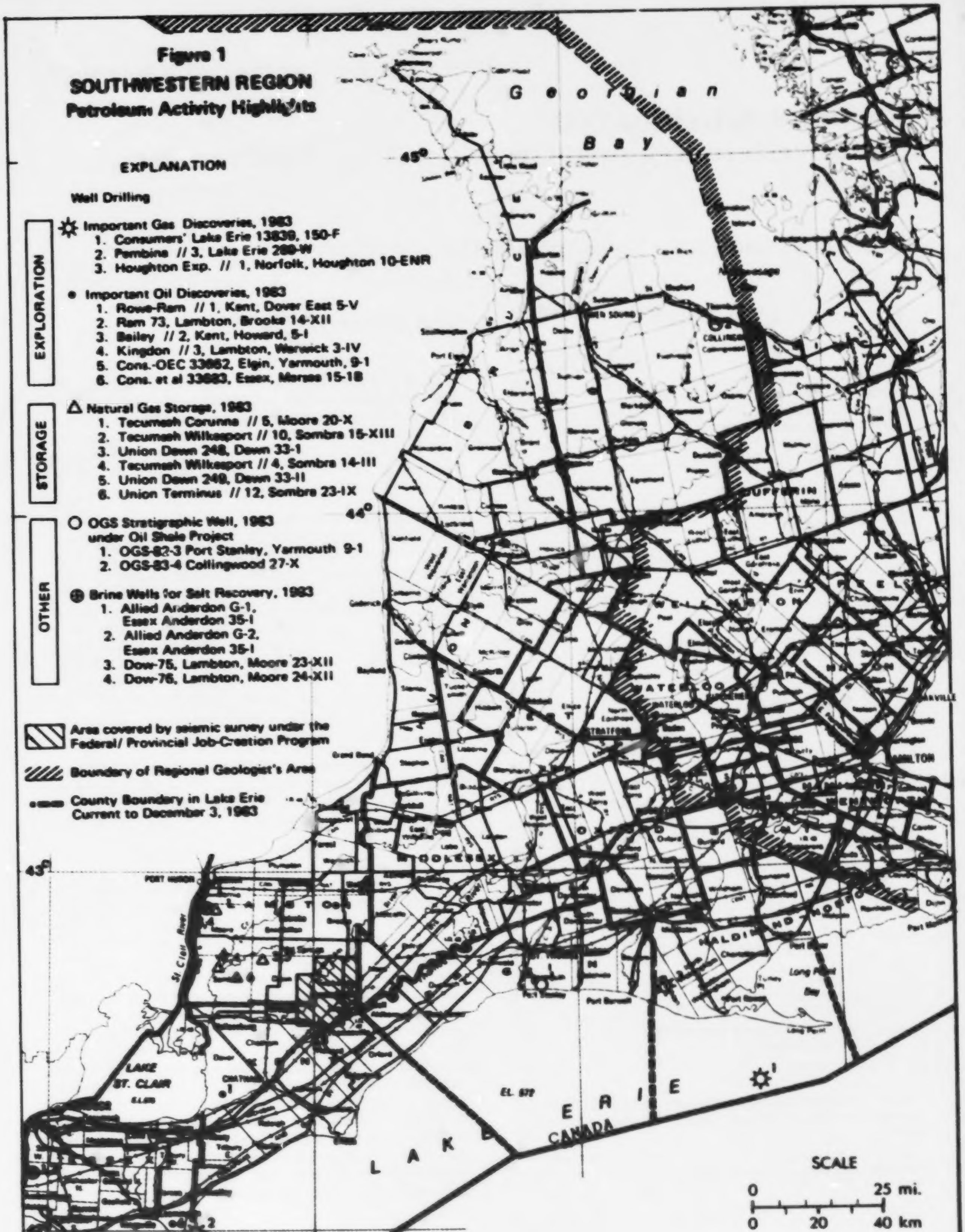
EXPLANATION
Well Drilling
EXPLORATION
☼ Important Gas Discoveries, 1983
1. Consumers' Lake Erie 13839, 150-F
2. Pembina // 3, Lake Erie 289-W
3. Houghton Exp. // 1, Norfolk, Houghton 10-ENR
● Important Oil Discoveries, 1983
1. Rowe-Ram // 1, Kent, Dover East 5-V
2. Ram 73, Lambton, Brooke 14-XII
3. Bailey // 2, Kent, Howard, 5-I
4. Kingdon // 3, Lambton, Warwick 3-IV
5. Cons.-OEC 33862, Elgin, Yarmouth, 9-1
6. Cons. et al 33883, Essex, Mersea 15-18
STORAGE
△ Natural Gas Storage, 1983
1. Tecumseh Corunna // 5, Moore 20-X
2. Tecumseh Wilkesport // 10, Sombra 15-XIII
3. Union Dawn 248, Dawn 33-1
4. Tecumseh Wilkesport // 4, Sombra 14-III
5. Union Dawn 249, Dawn 33-II
6. Union Terminus // 12, Sombra 23-IX
OTHER
○ OGS Stratigraphic Well, 1983 under Oil Shale Project
1. OGS-82-3 Port Stanley, Yarmouth 9-1
2. OGS-83-4 Collingwood 27-X
⊕ Brine Wells for Salt Recovery, 1983
1. Allied Anderdon G-1, Essex Anderdon 35-I
2. Allied Anderdon G-2, Essex Anderdon 35-I
3. Dow-75, Lambton, Moore 23-XII
4. Dow-76, Lambton, Moore 24-XII
▧ Area covered by seismic survey under the Federal/ Provincial Job-Creation Program
▨ Boundary of Regional Geologist's Area
County Boundary in Lake Erie
Current to December 3, 1983
Georgian Bay
45°
44°
43°
83°
82°
81°
80°
DUFFERIN
WATERLOO
STRATFORD
MIDDLESEX
LAMBTON
HALDIMAND
HAMILTON
PORT HURON
St Clair River
LAKE ST. CLAIR
LAKE ERIE
CANADA
Long Point Bay
SCALE
0
25 mi.
0
20
40 km

Figure 1
SOUTHWESTERN REGION
Petroleum Activity Highlights

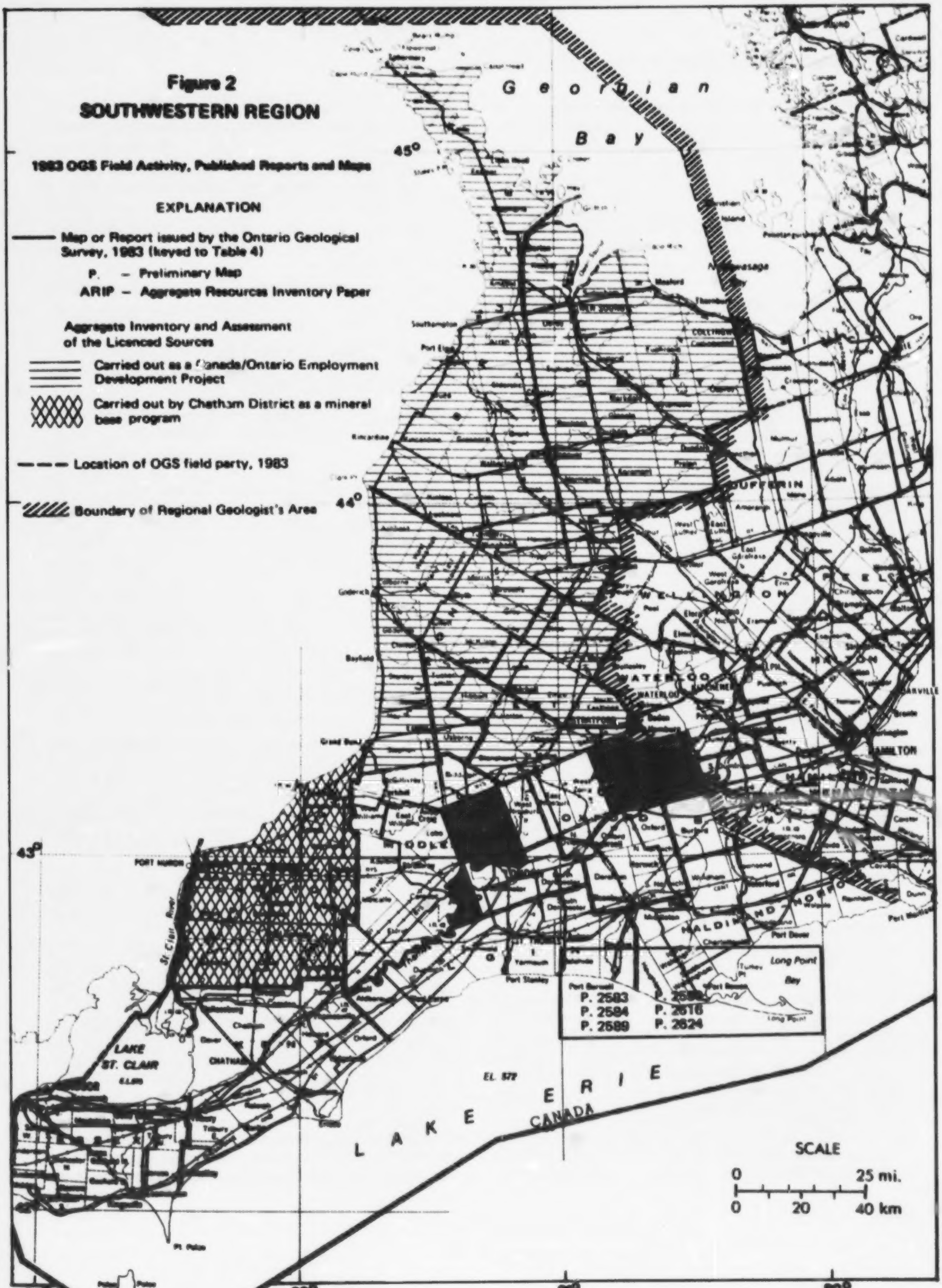

Figure 2
SOUTHWESTERN REGION

1983 OGS Field Activity, Published Reports and Maps

EXPLANATION
Map or Report issued by the Ontario Geological Survey, 1983 (keyed to Table 4)
P. – Preliminary Map
ARIP – Aggregate Resources Inventory Paper
Aggregate Inventory and Assessment of the Licenced Sources
Carried out as a Canada/Ontario Employment Development Project
Carried out by Chatham District as a mineral base program
Location of OGS field party, 1983
Boundary of Regional Geologist's Area
Georgian Bay
45°
44°
43°
DUFFERIN
WELLINGTON
PEEL
WATERLOO
HALTON
HAMILTON
HALDIMAND
NORFOLK
Port Huron
St. Clair River
LAKE ST. CLAIR
CHATHAM
Port Stanley
Port Dover
Long Point Bay
Long Point
P. 2583
P. 2584
P. 2589
P. 25..
P. 2616
P. 2624
LAKE ERIE
CANADA
EL. 572
Pt. Pelee
Pelee Island
SCALE
0
25 mi.
0
20
40 km
83°
82°
81°
80°

ing, please contact the Department of Geology, University of Western Ontario, London, Ontario N6A 5B7, (519)679-3414

# Regional Geologist's Office Activites

## Petroleum Resources Laboratory Activities

The main function of the Petroleum Resources Laboratory is to catalogue and preserve all subsurface geological samples obtained from the drilling of petroleum exploration wells. Samples consist of drill cuttings and cores. For the period January 1 to December 3, 1983, 195 wells were drilled (*see* Table 1). The cuttings from these wells were sorted, washed, catalogued, and stored as soon as they were received from the field. The cores received were cut, catalogued, and stored.

During the year, the formation tops of all wells drilled in 1982 were determined. Well cards for all of these wells are now available to the public. A complete index for all the cores obtained from the drilling of oil and gas wells in Ontario was prepared. All wells penetrating the Ordovician Trenton Group were compiled into a special index. Both the core index and deep well index are available at the Petroleum Resources Laboratory and will be published in the Oil and Gas Paper 5, in May 1984.

The computerized Ontario Well Data System (OWDS) is being upgraded and expanded into an up-to-date Data Base Management System, in order to offer faster data retrieval service to the petroleum industry. The greater versatility in data manipulation as well as machine access will be made available to users. The new petroleum data system will also offer greater computer mapping capability. The new system is expected to be functional by the middle of 1984.

As part of the Hydrocarbon Energy Resources Program (HERP), funds from the Ontario Ministry of Treasury and Economics, under ther Board of Industrial Leadership and Development (BILD) Program, were allocated to the Petroleum Resources Section to evaluate the proven and potential conventional reserves of oil and gas in Ontario. The project objective is to provide the petroleum industry and Ontario Ministry of Natural Resources with a revised current evaluation of the oil and gas reserves and potential of the Paleozoic rocks of Ontario. Areas underlain by Paleozoic rocks in southwestern Ontario, the St. Lawrence Lowlands, and the James Bay/Hudson Bay Lowlands will be re-evaluated in the study. The study has been separated into 7 phases as follows:

Phase 1. Evaluation of the conventional hydrocarbon reserves and potential of the Ordovician rocks of Ontario

Phase 2 Evaluation of the conventional hydrocarbon reserves and potential of the Cambrian rocks of Ontario

Phase 3 Evaluation of the conventional hydrocarbon reserves and potential of the Devonian rocks of Ontario

Phase 4 Evaluation of the conventional hydrocarbon reserves and potential of the Silurian sandstones of Ontario

Phase 5 Evaluation of the conventional hydrocarbon reserves and potential of the Silurian Reef Complex of Ontario

Phase 6 Evaluation of the oil and gas potential of Paleozoic rocks in the James Bay and Hudson Bay Lowlands of Ontario

Phase 7 Summary and publication of the findings of Phases 1 to 6 studies of the Project

Phases 1 and 2 of the project have been completed and the findings will be published shortly as Open File Reports. Forty Preliminary Maps, covering the Province of Ontario at 1:250 000 scale, and showing the regional structures and isopachs of the Trenton Group, Black River Group, Shadow Lake Formation, and top of the Precambrian Basement; and detailed oil and gas pool maps at 1:20 000 scale for 6 Cambrian pools and 10 Ordovician pools, will accompany the Open File Reports. Phases 3 and 4 of the study are in progress and reports are expected by the end of March, 1984. The regional maps completed for Phase 3 of the study, at a scale of 1:100 000, include the following:

1. Structure top of Devonian carbonate
2. Structure top sulphur water porosity
3. Isopach top Devonian carbonate to top sulphur water porosity
4. Structure Base Columbus sandstone
5. Isopach gross Columbus sandstone
6. Isopach gross Oriskany-Springvale sandstone
7. Isopach gross Sylvania sandstone.

Phase 5 of the project will be undertaken in the 1984-1985 fiscal year while Phases 6 and 7 are scheduled for 1985-1986.

An annual status report (Booth-Horst 1983) entitled Oil and Gas Developments in Eastern Canada in 1982, was compiled and written for the American Association of Petroleum Geologists Bulletin. This report summarized petroleum activities in Ontario and Eastern Canada and highlighted the exploration and production trends. The same report is scheduled for publication by the Canadian Society of Petroleum Geologists. A limited number of reprints are available at the Petroleum Resources Laboratory.

A project on fault pattern analyses and detection is in progress. The study is based on structural mapping of the top of the Rochester Formation. The revision of the report on subsurface stratigraphy in Southwestern Ontario and compilation of water analyses from oil and gas wells are also in progress.

The Petroleum Resources Laboratory received 800 visitors during 1983. These visitors included petroleum industry personnel, consultants, university students, and the general public.

## Other Petroleum Exploration Related Activities

The Southwestern Region has been instrumental in developing and securing approval for 2 job-creation projects related to the petroleum industry within the framework of a Joint Federal-Provincial Mining Sector Work Program. These projects were jointly funded by the Canada Employment and Immigration Commission and the Ontario Board of Industrial Leadership and Development (BILD) through the Ontario Ministry of Natural Resources. The first was a proposal by Elexco Limited of London, Ontario, a land service company, to develop a computerized Land Tenure System for onshore southern Ontario. The project generated 394 work weeks for 29 new employees. The computer file is now operational and Elexco Limited is able to access information on 7.5 million acres of land, of which 2 to 3 million acres is currently held under oil and gas leases. Information within the system is available to interested parties through Elexco Limited on a user pay basis.

The second approved project was submitted by Cangeo Limited of Oil Springs, Ontario, to carry out a seismic survey in Lambton and Kent Counties (*see* Figure 1). Under the project, Cangeo Limited hired and trained 52 unemployed workers. A total of 346 km of seismic data was acquired, processed, and intepreted. Reports are available from Cangeo Limited to all interested exploration companies on a cost-shared basis to cover the expenses of processing and interpretation of the data. The interpretation of data has revealed several Silurian reef structures and Trenton faults in the Ordovician formations which may have potential for oil and gas accumulations. Several companies have initiated leasing of land in the general area. Exploration test drilling is expected to take place soon.

A stratigraphic test well OGS-82-3 drilled under the Ontario Geological Survey Oil Shale Assessment Project near Port Stanley in Yarmouth Township (Figure 1) provided encouraging new information for oil exploration. The well encountered a good oil showing in the Cambrian section between 1125 and 1135 m of depth. A total of 46 m (from depths of 1099.1 to 1145.1 m) of NW size core were submitted to Core Laboratory Canada Limited for full diameter core analysis. The results of the core analysis were very encouraging. Utilizing the results of the core analysis, detailed visual inspection of slabbed core, and analysis of the available geophysical logs, personnel of the Petroleum Resources Laboratory have defined 3 distinct porosity-permeability zones in the Cambrian section. Some of the core analysis results are listed in Table 2. The slabbed core samples, complete core analysis results, geophysical logs, and preliminary reports are available for inspection at the Petroleum Resources Laboratory. The Port Stanley area, where faults are believed to be the main trapping mechanism, is relatively unexplored for Cambrian targets and therefore represents an excellent opportunity to explore for new Cambrian pools. The Port Stanley well is of particular significance because it represents the first fault-bounded potential reservoir located in Cambrian sandstones that is not associated with a pinch-out edge of the formation. The entire area south of the traditional edge of Cambrian rocks may now be considered to have the potential to hold significant new reservoirs. A recent exploration well, Cons-OEC 33662, drilled in the Yarmouth area (Figure 1) by Consumers' Gas was completed as an oil producer, however, the results of tests have not yet been released to the public.

B.V. Sandford, Senior Research Scientist of the Geological Survey of Canada, delivered a paper entitled "Paleozoic Tectonics of the Canadian Craton and Their Effect on the Migration and Entrapment of Hydrocarbon Along the Eastern Rim of the Michigan Basin in Ontario" at the Ontario Petroleum Institute's 22nd Annual Conference in London, Ontario. The paper highlighted interpretation of fracture patterns from the structural contour map of the Rochester Formation and implications regarding overlying and underlying sediments. The paper represents a significant advance in the technical knowledge of the tectonic framework in southwestern Ontario. A new understanding of the orientation of the fracture patterns in Palezoic rocks of Ontario will provide a framework for locating tilted Cambrian fault blocks, and the consequent new targets for potential oil reservoirs similar to the Port Stanley discovery. Correlation of the fracture pattern with dolomitization porosity in Ordovician formations suggests that new prospecting areas along the fracture trends will be recognized and explored. Sanford has also suggested that Silurian pinnacle reefs may have initiated growth on tectonic highs created by tilted blocks within the fracture zones. The results of Sanford's study have therefore created the potential to develop a large variety of new exploration plays in southwestern Ontario. The paper has been submitted for publication in the Bulletin of Canadian Petroleum Geology.

## Mineral Resources Activities

### Consultative and Educational Services

During 1983, the Mineral Resources Geologist provided advisory services to the private industry, to government agencies, and to the general public regarding local and regional Quaternary and Paleozoic geology, industrial mineral resources and commodities, mineral inventories carried out in the Region, mining and exploration activities, pit and quarry plans, land-use plans, various Federal-Provincial funded programs, and mineral resources related legislation, policies, and procedures. In addition, *SOUTHWESTERN REGION*

TABLE 1

**SUMMARY OF THE WELLS DRILLED IN 1983**
**(JAN. 1 – DEC. 31)**

| COUNTY & Township | EXPLORATORY Gas | Oil | Dry | Total | Metres | DEVELOPMENT Gas | Oil | Dry | Total | Metres | OTHER Total | Metres |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALGOMA | - | - | - | - | - | - | - | - | - | - | 1 | 349.0 |
| Jocelyn | - | - | - | - | - | - | - | - | - | - | 1 strat test | 349.0 |
| DISTRICT OF | - | - | - | - | - | - | - | - | - | - | 1 | 624.5 |
| COCHRANE | - | - | - | - | - | - | - | - | - | - | 1 strat test | 624.5 |
| DURHAM | - | - | - | - | - | - | - | - | - | - | 1 | 249.9 |
| Pickering | - | - | - | - | - | - | - | - | - | - | 1 obs. | 249.9 |
| ELGIN | - | 1 | 1 | 2 | 2226.0 | 3 | - | 3 | 6 | 3485.9 | 1 | 1166.4 |
| S.Dorchester | - | - | 1 | 1 | 1066.0 | - | - | - | - | - | - | - |
| Lake Erie | - | - | - | - | - | 3 | - | 3 | 6 | 3485.9 | - | - |
| Yarmouth | - | 1 | - | 1 | 1160.0 | - | - | - | - | - | 1 strat test | 1166.4 |
| ESSEX | - | 1 | 6 | 7 | | 2 | 2 | 3 | 7 | | 3 | 1108.1 |
| Anderdon | - | - | - | - | - | - | - | - | - | - | 2 brine | 747.3 |
| | - | - | - | - | - | - | - | - | - | - | 1 obs. | 360.8 |
| Colchester S. | - | - | - | - | - | - | 1 | - | 1 | 670.1 | - | - |
| Lake Erie | - | - | 4 | 4 | 1717.0 | 2 | - | 3 | 5 | 2292.1 | - | - |
| Mersea | - | 1 | 2 | 3 | 2612.2 | - | 1 | - | 1 | 1066.2 | - | - |
| GREY | - | - | - | - | - | - | - | - | - | - | 1 | 94.8 |
| Collingwood | - | - | - | - | - | - | - | - | - | - | 1 strat test | 94.8 |
| HALDIMAND | - | - | 3 | 3 | | 15 | - | 5 | 20 | | - | - |
| S. Cayuga | - | - | - | - | - | - | - | 1 | 1 | 250.3 | - | - |
| Dunn | - | - | - | - | - | 2 | - | - | 2 | 519.0 | - | - |
| Lake Erie | - | - | 3 | 3 | 1213.8 | 12 | - | 4 | 16 | 5736.2 | - | - |
| Moulton | - | - | - | - | - | 1 | - | - | 1 | 208.8 | - | - |
| HALTON | - | - | - | - | - | - | - | - | - | - | 1 | 635.6 |
| Nassagaweya | - | - | - | - | - | - | - | - | - | - | 1 strat test | 635.6 |
| HURON | - | - | 3 | 3 | 1855.6 | 2 | - | 1 | 3 | 2353.7 | - | - |
| Goderich | - | - | 2 | 2 | 1253.6 | 1 | - | 1 | 2 | 1779.7 | - | - |
| Stanley | - | - | 1 | 1 | 602.0 | 1 | - | - | 1 | 574.0 | - | - |

**TABLE 1 Continued**

| COUNTY & | EXPLORATORY | | | | | DEVELOPMENT | | | | | OTHER | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Township | Gas | Oil | Dry | Total | Metres | Gas | Oil | Dry | Total | Metres | Total | Metres |
| KENT | 1 | 1 | 6 | 8 | | - | 11 | 7 | 18 | | 7 | 1116.9 |
| Camden | - | - | - | - | - | - | 1 | - | 1 | 103.8 | 1 obs. | 203.8 |
| | - | - | - | - | - | - | - | - | - | - | 4 strat tests | 560.1 |
| Camden Gore | - | - | - | - | - | - | - | - | - | - | 2 strat tests | 353.0 |
| Dover East | - | 1 | - | 1 | 1026.5 | - | - | 3 | 3 | 3472.6 | - | - |
| Howard | - | - | 2 | 2 | 2514.7 | - | 1 | - | 1 | 106.0 | - | - |
| Lake Erie | 1 | - | 3 | 4 | 2018.1 | - | - | 4 | 4 | 1975.0 | - | - |
| Orford | - | - | 1 | 1 | 1275.2 | - | - | - | - | - | - | - |
| Tilbury E. | - | - | - | - | - | - | 9 | - | 9 | 3971.2 | - | - |
| LAMBTON | - | 2 | 9 | 11 | 6038.3 | - | 8 | 4 | 12 | 4322.5 | 15 | 6289.3 |
| Bosanquet | - | - | 1 | 1 | 170.4 | - | - | 1 | 1 | 180.7 | - | - |
| Brooke | - | 1 | 1 | 2 | 773.2 | - | - | - | - | - | - | - |
| Dawn | - | - | 1 | 1 | 648.8 | - | 3 | 1 | 4 | 2385.7 | 2 gas str | 1122.5 |
| Enniskillen | - | - | 3 | 3 | 2004.7 | - | 5 | 1 | 6 | 896.1 | 1 disp | 243.8 |
| Moore | - | - | 2 | 2 | 1497.3 | - | - | - | - | - | 1 gas str | 714.3 |
| | - | - | - | - | - | - | - | - | - | - | 2 brine | 1526.0 |
| Sarnia | - | - | 1 | 1 | 797.6 | - | - | 1 | 1 | 860.0 | - | - |
| Sombra | - | - | - | - | - | - | - | - | - | - | 3 gas str | 1794.1 |
| Euphemia | - | - | - | - | - | - | - | - | - | - | 6 strat tests | 888.6 |
| Warwick | - | 1 | - | 1 | 146.3 | - | - | - | - | - | - | - |
| LINCOLN | - | - | - | - | - | 2 | - | - | 2 | 280.5 | - | - |
| Caistor | - | - | - | - | - | 2 | - | - | 2 | 280.5 | - | - |
| MANITOULIN | - | - | - | - | - | - | - | - | - | - | 1 | 220.6 |
| Howland | - | - | - | - | - | - | - | - | - | - | 1 strat test | 220.6 |
| MIDDLESEX | - | - | 1 | 1 | 132.5 | - | 5 | 3 | 8 | 1018.3 | 7 | 1117.7 |
| Mosa | - | - | 1 | 1 | 132.5 | - | 5 | 3 | 8 | 1018.3 | 1 injec | 117.4 |
| | - | - | - | - | - | - | - | - | - | - | 6 strat tests | 1000.3 |

**TABLE 1 Continued**

| COUNTY & Township | EXPLORATORY Gas | Oil | Dry | Total | Metres | DEVELOPMENT Gas | Oil | Dry | Total | Metres | OTHER Total | Metres |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NORFOLK | 2 | - | 4 | 6 | 3218.5 | 26 | - | 10 | 36 | 17279.0 | - | - |
| Charlotteville | - | - | - | - | - | 7 | - | 1 | 8 | 3311.8 | - | - |
| Houghton | 1 | - | - | 1 | 423.9 | - | - | - | - | - | - | - |
| Lake Erie | 1 | - | 4 | 5 | 2683.2 | 15 | - | 8 | 23 | 11413.2 | - | - |
| N.Walsingham | - | - | - | - | - | 2 | - | 1 | 3 | 1231.5 | - | - |
| S.Walsingham | - | - | - | - | - | 2 | - | - | 2 | 889.0 | - | - |
| OXFORD | - | - | - | - | - | - | - | 1 | 1 | 1204.0 | - | - |
| Blandford | - | - | - | - | - | - |  | 1 | 1 | 1204.0 | - | - |
| PEEL | - | - | - | - | - | - | - | - | - | - | 1 | 494.4 |
| Toronto | - | - | - | - | - | - | - | - | - | - | 1 obs. | 494.4 |
| WENTWORTH | - | - | - | - | - | 1 | - | - | 1 | 137.6 | - | - |
| Binbrook | - | - | - | - | - | 1 | - | - | 1 | 137.6 | - | - |
| TOTAL 1983 | 3 | 5 | 33 | 41 | 25737.0 | 51 | 26 | 37 | 114 | 50019.3 | 40 | 3467.2 |

TOTAL 1983 wells = 195
metres = 89,223.5

TOTAL 1982 wells = 163 *
metres = 73,079.9

* Not including four lost holes

several talks were presented at the University of Western Ontario and at training and development seminars for Pits and Quarries, and Petroleum Resources Inspectors.

## Symposium and Organized Tours

The Sixth International Symposium on Salt held at Toronto was attended, as were field excursions to view the Quaternary geology of the Long Point-Port Burwell area (organized by P.J. Barnett, Engineering and Terrain Geology Section, Ontario Geological Survey, Toronto), and the operations of Manitoulin Dolomite Incorporated at Meldrum Bay (organized by the Aggregate Producers Association of Ontario).

## Projects

The Mineral Resources Geologist provided base geological and aggregate resources data for the preparation of inventory reports by the Ontario Geological Survey for the Townships of Derby, Holland, Keppel, Sydenham, and Sarawak, and the City of Owen Sound in Grey County.

Aided by summer assistant H. Watson, a regional inventory of the heavy clay products industry and its supplies was carried out. The following plants are presently operating: (1) Canada Vitrified Products Limited at St. Thomas; (2) Coultis and Son Limited at Thedford; (3) Dresden Tile Yard (1981) Limited; (4) Amos C. Martin Limited

TABLE 2

CORE ANALYSIS

OGS 82-3 Port Stanley Stratigraphic Test

| Interval (m) | Average Porosity (%) | Average Permeability (Millidarcies) | Residual Oil Saturation (%) | Residual Water Saturation (%) | Calculated Avg. Oil Saturation (%) |
|---|---|---|---|---|---|
| 1132 - 1143 | 8.7 | 112.14 | 11.8 | 17.0 | 18.2 |
| 1122 - 1132 | 3.6 | 3.46 | 14.7 | 14.3 | 18.3 |
| 1107 - 1122 | 6.2 | 100.69 | 4.1 | 9.7 | 5.7 |

at Parkhill; (5) Meaford Tile Limited; (6) Norwich Brick and Tile; and (7) Paisley Brick and Tile Company. The first draft of the report covering literature, clay and shale deposits and physical properties, plant profiles, products (farm drainage pipes, and flue linings), and markets has been completed. The final report, including an assessment of specifications for a variety of clay products and supplies, is expected to be completed in 1984. Input has been provided to the Industrial Minerals Section regarding the terms of reference for a province-wide study of clay and shale resources and industries.

### Plant and Property Visits

All (25) quarry and underground mining operations and associated processing facilities for salt, high-calcium lime, fluxstone, pulverized stone, grey and white Portland cement, crushed stone, and building stone products were visited during 1983 for inventory purposes. Representative field samples of the various deposits, as well as polished specimens from the Adair Marble, Clearstone, Ebel, Owen Sound Ledgerock, Ross, and Smithson operations, all in the Owen Sound-Wiarton area of the Bruce Peninsula, are on display at the Petroleum Resources Laboratory. Based on building stone industry needs in the Bruce Peninsula, a proposal for a study identifying new and viable building stone deposits in the Bruce and Grey Counties has been made to the Mineral Resources Group of the Ontario Ministry of Natural Resources for consideration for joint Federal-Provincial funding.

### Aggregate Inventory and Assessment of Licenced Sources

Two aggregate inventory projects are being carried out by district staff with technical guidance provided by regional staff of the Ontario Ministry of Transportation and Communications and the Ontario Ministry of Natural Resources. The Wingham District staff (Mineral Resources Supervisor T. Carter and 4 contract geologists) are currently engaged in an inventory and assessment of licenced sand and gravel aggregate resources in the Wingham and Owen Sound District areas (Figure 2). This 1-year project is funded by the Canada-Ontario Employment Development Program. Field work has been completed and all samples have been forwarded to the Ontario Ministry of Transportation and Communications for aggregate testing. The remainder of the project consists of data compilation, interpretation, and report writing. The project is to end by March 31, 1984. A geological assistant for the summer at the Chatham District completed a similar project in Lambton County (Figure 2) for immediate input to the land-use planning process. All samples have also been forwarded to the Ontario Ministry of Transportation and Communications for sand and gravel aggregate quality testing. The sand-size fraction of all samples from both projects will be stored at the Petroleum Resources Laboratory, for future mineralogical and chemical composition analysis to determine the potential of the inventoried fine aggregate supplies for various industrial applications.

# Ontario Geological Survey Activities

## Engineering and Terrain Geology Section

The Engineering and Terrain Geology Section continued to evaluate the oil shale potential of Southwestern Ontario. A current detailed discussion of the results of the project are presented by Johnson (1983).

Surface mapping of the Quaternary deposits in the Long Point and Port Burwell areas (Figure 2) has been completed by P.J. Barnett and assistants, and preliminary maps showing the Quaternary geology, drift thickness, and bedrock surface topography of both areas have been published (see Table 4). During the summer of 1983, Barnett made detailed field investigations of the stratigraphy and origin of till and proglacial lake sediment sequences exposed along the Lake Erie shore bluffs and inland stream valleys. The results of the survey of this area will be contained in a geological report which is in preparation.

Staff of the Aggregate Assessment Office carried out field investigations during the summer of 1983 of the surficial aggregate resources of the Townships of Keppel, Sarawak, and Sydenham in the Owen Sound-Wiarton area of Grey County (Figure 2). Surficial deposits of sand and gravel in this area were found to be small and scattered, and are mainly suitable for local supplies of aggregate for products of low specifications. In contrast, the bedrock resource in this area is potentially large and capable of providing a much wider range of aggregate products for more demanding specifications. The results of this survey will be included in the appropriate Aggregate Resources Inventory Papers. As assessment of the surfical aggregate resource potential of this area for immediate input to the land-use planning process has been forwarded to the Grey County municipal office.

# Ontario Geoscience Research Grants

The following received Ontario Geoscience Survey Research Grants:

T.F. Barker, University of Waterloo - "Organic Geochemistry of Ontario's Possible Oil Shales";

P. Fritz, University of Waterloo - "Geochemical and Isotopic Investigations of the Salina Formation";

P.E. Holm, University of Windsor - "Strength Testing of Reservoir Strata in the Grimsby Formation (Lower Silurian) of Southwestern Ontario".

# Petroleum Activity Statistics

The following preliminary statistics include data obtained from wells drilled between January 1 and December 3, 1983. The 1983 figures are compared with data for wells drilled from January 1 to December 4, 1982, as published in the 1982 Report of the Southwestern Regional Geologist. Final figures will be available in the "Oil and Gas Exploration, Drilling, and Production Summary, 1983" (Oil and Gas Paper 6) to be published in 1985.

Most oil and natural gas exploration and development in Ontario was conducted in the Southwestern and Central Regions and in Lake Erie. Table 1 provides a summary of wells drilled in Ontario in 1983, listed by county and township. A total of 195 wells were drilled in 1983 compared with 167 wells (including 4 lost holes ) in 1982. This represents an increase of 16.8%. The total length of section drilled during January 1 to December 3, 1983 was 89 223.5 m, up by 22% from 73 079.9 m (corrected for water depths) in 1982. Correction has been made for the previous inclusion of water depth in the length of metres penetrated for all the Lake Erie wells.

Offshore drilling statistics for natural gas in Lake Erie are shown in Table 3. Drilling increased 9.4% from 64 wells in 1982 (not including 1 lost hole and 1 anchor mooring hole). By December 3, 1983, an overall total of 1602 wells had been drilled in Lake Erie.

Of the 70 wells drilled offshore in 1983, 16 were classified as exploratory wells and 54 were classified as development wells of the known pools. Offshore drilling was 48.6% successful during 1983, with 34 of the 70 wells being producers, a drop of 9.2% from 1982. A total length of 32 534.5 m of section was penetrated under Lake Erie during 1983, up 9.4% from 29 728.3 m (corrected for water depths) drilled in 1982.

Of the approximate total of 1.1 million hectares available for exploration in Lake Erie, 563 849.8 hectares are presently under lease and 301 364.7 hectares under exploratory licence of occupation. A total of about 232 100 hectares is therefore available for gas exploration.

On land, a total of 125 wells including 40 "Other" nonexploratory and nondevelopment wells, were drilled for a total length of 56 689 m. Land wells were 60% successful with 6 of 25 exploratory wells and 45 of 60 development wells being completed as producers.

During 1983, 9 exploratory wells were completed as producers, 6 oil and 3 gas. The number of oil discoveries in 1983 increased to 6 from 5 in 1982. While all the oil discoveries of 1982 were made in Devonian reservoirs, half of the number of oil discoveries this year were made in deeper Cambrian and Ordovician reservoirs. There appears to have been an important shift in exploration strategy to a search for deeper targets and results to date have been encouraging. The expected release of consultant's reports on the "Oil and Gas Potential of the Cambrian and Ordovician Parts of the Hydrocarbon Assessment Project" and the incentive offered under the New Oil Reference Price (NORP) program for new oil production should provide the petroleum industry with further impetus in the search for additional oil from deeper reservoirs (Rybansky 1983).

The oil production for 1983 for Ontario is estimated to be 85 000 m$^3$, whereas the gas production is estimated to be 440 x 10$^6$ m$^3$. No oil production is permitted from Lake Erie under international agreement.

# Industrial Minerals

## Aggregates

During 1982 in the Southwestern Region, total production of sand, gravel, stone, clay, and shale from pit and quarry

**TABLE 3** LAKE ERIE DRILLING FOR 1983

| COUNTY | EXPLORATORY | | | | DEVELOPMENT | | | | OTHER | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Gas | Dry | Total | Metres | Gas | Dry | Total | Metres | Total | Metres |
| ELGIN | - | - | - | - | 3 | 3 | 6 | 3485.9 | - | - |
| ESSEX | - | 4 | 4 | 1717.0 | 2 | 3 | 5 | 2292.1 | - | - |
| HALDIMAND | - | 3 | 3 | 1213.8 | 12 | 4 | 16 | 5736.2 | - | - |
| KENT | 1 | 3 | 4 | 2018.1 | - | 4 | 4 | 1975.0 | - | - |
| NORFOLK | 1 | 4 | 5 | 2683.2 | 15 | 8 | 23 | 11413.2 | - | - |
| TOTAL | 2 | 14 | 16 | 7632.1 | 32 | 22 | 54 | 24902.4 | - | - |

| | No. of Wells | Total Metres Drilled |
|---|---|---|
| 1983 total | 70 | 32534.5 |
| 1982 total | 64 * | 29728.3 ** |

* not including 1 lost hole and 1 anchor mooring hole

** the figure has been corrected for water depths

operations (licenced or wayside as permitted under The Pits and Quarries Control Act) declined to 21 million tonnes from 22.5 million tonnes in 1981.

Sand and gravel production from 571 licenced operations (Table 5) and 90 wayside operations was 16.7 million tonnes, roughly the same as 1981. Decreases in production in the Aylmer and Chatham Districts were offset by increases in the Wingham, Simcoe, and Owen Sound Districts.

In 1982, total stone quarried at 16 licenced operations was 4 million tonnes (Table 5). Crushed stone production (99% of total) from 10 quarry operations declined by 28% from the previous year (1981). About 48% of the crushed stone tonnage is consumed in local manufacture of high-calcium lime. About 38% of the crushed stone is used in construction aggregate and pulverized stone products, and approximately 14% is consumed by the local cement manufacturing industry. Building stone tonnage production during 1982 at the Bruce Peninsula quarry operations (6), increased by 29% over the previous year

About 88% of the 0.3 million tonnes of clay and shale extracted by licenced operations in Southwestern Region during 1982 (Table 5) was from glacial drift. Most of the clay is used for manufacture of grey portland cement at Woodstock and St. Marys. Use of clay for manufacture of cement declined considerably from 1981 because of decreased demand. The remainder (12%) is clay and shale used in the manufacture of farm drainage tiles or pipes in plants at Parkhill, Thedford, Dresden, Meaford, and Norwich; and the total tonnage of material extracted was nearly the same as in 1981.

## Salt

Ontario's increasing salt production, approximately 6.3 million tonnes in 1983, comes from underground mines and brine well operations in the Salina Formation at Goderich, Windsor, Sarnia, and Amherstburg.

A combined total of approximately 5 million tonnes of rock salt was extracted from the A-2 Unit at Domtar's Goderich Mine and from the B Unit at Canadian Rock Salt Company Limited's Ojibway Mine at Windsor. The third shaft at Domtar's Goderich Mine was opened in September 1983 and is expected to boost annual production by 55%.

TABLE 4 MAPS AND REPORTS PERTAINING TO THE RESIDENT GEOLOGIST'S AREA PUBLISHED DURING THE YEAR BY THE ONTARIO GEOLOGICAL SURVEY, MINISTRY OF NATURAL RESOURCES.

**Ontario Geological Survey Reports**

**Open File Reports**

OFR 5363
OFR 5459
OFR 5460
OFR 5472

**Preliminary Maps - Geological Series**

P. 2583
P. 2584
P. 2589
P. 2590
P. 2616
P. 2624

**Preliminary Maps - Data Series**

**Aggregate Resources Publications**

ARIP 55
ARIP 63
ARIP 68
ARIP 76

**Federal - Provincial Maps**

**Coloured Maps**

**Northern Ontario Engineering Geology Terrain Studies Reports**

**Northern Ontario Engineering Terrain Studies Maps**

**Mineral Resources Branch Publications**

**Miscellaneous Reports**

Oil and Gas Paper 4: Oil and Gas Exploration, Drilling and Production Summary 1981

**Geological Survey of Canada Open File Reports**

Miscellaneous Publications

1. AAPG Paper: Oil and Gas Developments in Eastern Canada, in 1982
2. Geochemical Series Map
   Map 080612: The Southwest Ontario Geochemical Survey

TABLE 5 AGGREGATE PRODUCTION FROM LICENSED PITS AND QUARRIES DURING THE YEAR (1982)

| District | Number of Designated Townships | Number of Licensed Pits and Quarries * | Sand and Gravel (Tonnes) | Stone (Tonnes) | Clay and Shale (Tonnes) | Total (Tonnes) |
|---|---|---|---|---|---|---|
| Aylmer | 29<br>(all) | 141<br>(70% of total) | 5 262 162 | 2 243 213 | 142 667 | 7 648 042 |
| Chatham | 35<br>(all) | 65<br>(53% of total) | 1 866 030 | 1 195 610 | 12 581 | 3 074 221 |
| Owen Sound | 28<br>(all) | 152<br>(80% of total) | 2 427 995 | 148 577 | 6 545 | 2 583 117 |
| Simcoe | 15<br>(all) | 24<br>(69% of total) | 521 982 | 122 755 | 2 450 | 647 187 |
| Wingham | 32<br>(all) | 211<br>(77% of total) | 3 397 281 | 247 010 | 112 179 | 3 756 470 |
| TOTALS | 139<br>(all) | 593<br>(72% of total) | 13 475 450 | 3 957 165 | 276 422 | 17 709 037 |

* Producing

Sources: Ministry of Natural Resources District Offices in Southwestern Region, 1983

Approximatly 1.3 million tonnes of fine salt was extracted by brine well operations from the A-2 and B Units at Sarnia (Dow Chemical), and from the B Unit at Amherstburg (Allied Chemical), Windsor (Canadian Rock Salt), and Goderich (Domtar). Several new brine wells are under development near Amherstburg, Sarnia, and Goderich (see Figure 1).

## Thesis Projects

The following geoscience research projects applicable to the Southwestern Region were undertaken as B.Sc. and M.Sc. Theses at the University of Western Ontario and Queen's University.

B.Sc. Theses

1. Aarssen - University of Western Ontario. Effects of Pinnacle Reefs on the Salina A-1 unit.
2. Bromley - University of Western Ontario. A Detailed Study of the Dunwich Till at Bradtville, North Shore of Lake Erie, Ontario.
3. Chalkey, P.- Queen's University. Depositional and Karstic Episodes, Lockport and Guelph Reef Units, Fletcher Field, Southwestern Ontario.
4. Gibbs, G.B.- Queen's University. A Detailed Core Analysis of the Upper Salina Group, The Fletcher Field, Southwestern Ontario.
5. Hill, V.- University of Western Ontario. Geology of the Point Pelee Pool: A Guelph patch reef complex in Kent County, Ontario.
6. Hughson - University of Western Ontario. A stratigraphic and petrographic study of the Silurian Guelph, Goat Island, and Gasport Formations, southwest Moore Township, Lambton County, Ontario.
7. Catfish Creek Till Members at Bradtville, North Shore of Lake Erie, Ontario.
8. Miller - University of Western Ontario. The Structure, Stratigraphy, Paleontology, and Morphology and Comparison of the Pinnacle Reefs in Dawn Township, Ontario.
9. Stagg, B.- Queen's University. Petrology of Amherstburg Formation, Middle Devonian, The Fletcher Field Area, Southwestern Ontario.

M.Sc. Theses

1. Delitala, F.- University of Western Ontario. Geology of the Kettle Point Formation.
2. Sultan, A.- University of Western Ontario. Variation of Amplitude with Distance for Shallow Seismic Reflection.

## References

Booth-Horst, Rae, Parker, Debra K., Palonen, P.A., and Trevail, R.A.
1983: Oil and Gas Developments in Eastern Canada in 1982; The American Association of Petroleum Geology Bulletin, Volume 67, Number 10, p.1656-1659.

Johnson, M.D.
1983: Oil Shale Assessment Project; p.122-125 *in* Summary of Field Work, 1983, by the Ontario Geological Survey, edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, Ontario Geological Survey, Miscellaneous Paper 116, 313p.

Rybansky, R.
1983: Effect of Petroleum Incentive Programs in Ontario; Proceedings of the 22nd Annual Conference of the Ontario Petroleum Institute (in press).

# APPENDIX

# Supplementary Index to Published Reports and Maps Mineral Resources Group 1983

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### Ontario Geological Survey Publications

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### Publications Funding

Many of the reports and maps listed in this supplementary index pertain to projects funded by government agencies outside of the Ontario Ministry of Natural Resources. To enable the reader to identify the sources of publications funding the following notations have been used:

*(BILD)*
A project funded by the Board of Industrial Leadership and Development of the Government of Ontario.

*(HERP)*
A project which is part of the Hydrocarbon Energy Resources Program and was funded by the Ontario Ministry of Treasury and Economics under the Board of Industrial Leadership and Development *(BILD)* Program.

*(KLIP)*
A project which is part of the Kirkland Lake Initiatives Program and was funded equally by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Northern Affairs under the Community and Rural Resource Development Subsidiary Agreement.

*(MSWP, Banc.)*
This inventory was aided by the Mining Sector Work Program, Bancroft.

*(NIMS)*
A project funded by the Ontario Ministry of Northern Affairs through the Northern Industrial Minerals Program.

*(NOGS)*
A project funded by the Ontario Ministry of Northern Affairs through the Northern Ontario Geological Survey Program.

*(NORDA)*
A project funded equally by the governments of Canada and Ontario under the Northern Ontario Rural Development Agreement.

*(Pembroke-Renfrew)*
This work is part of a Mineral Resource Assessment Project, Pembroke Renfrew Region. It was equally funded by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Treasury and Economics under the Community and Resource Development Subsidiary Agreement.

*(SOGS)*
A project which is part of the Southeastern Ontario Geological Survey and was funded equally by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Natural Resources under the Minerals Program of the Eastern Ontario Subsidiary Agreement.

*(South Nation)*
A project funded by the South Nation River Conservation Authority, the Federal Department of Regional Economic Expansion, and the Ontario Ministry of Natural Resources.

## Ontario Geological Survey Publications

### Reports

Report 46 (reprint)
Pleistocene Geology of the Scarborough Area; by P.F. Karrow, 108p. Accompanied by Maps 2076, 2077, scale 1:31 680, and 2 Charts. (Stock No. 6239)

Report 201
Geology of the Bethune Lake Area, Districts of Kenora and Rainy River; by G.R. Edwards, 59p. Accompanied by Map 2430, scale 1:31 680 or 1 inch to ½ mile. (Stock No. 6391)

Report 212
Summary of Metallogeny, Renfrew County Area; by S.B. Lumbers, 58p. Accompanied by Maps 2459, 2460, 2461, and 2462 and 1 chart. Scale 1:100 000. (Stock No. 6426) *(Pembroke-Renfrew)*

Report 217 (reprint)
Geology of the Hemlo Area, Thunder Bay District; by T.L. Muir, 65p. Accompanied by Map 2452, scale 1:31 680. (Stock No. 7716)

Report 221
Geology of the Sturgeon Lake Area, Districts of Thunder Bay and Kenora; by N.F. Trowell, 97p. Accompanied by Maps 2456, 2457, and 2458, scale 1:50 000, 1 Chart and 1 sheet of Microfiche. (Stock No. 6435)

Report 223
Geology of the Manitou Lakes Area (Stratigraphy and Petrochemistry), District of Kenora; by C.E. Blackburn, 61p. Accompanied by Map 2476, scale 1:50 000. (Stock No. 6437)

Report 224
Geology of the Flying Loon Lake Area, District of Kenora (52 G/13,14; 52 J/3,4); by N.F. Trowell, J.R. Bartlett, and R.H. Sutcliffe, 109p. Accompanied by Maps 2458 and 2477, scale 1:50 000 and 1 Chart. (Stock No. 6438)

Report 225
Geology of Natal and Knight Townships, Districts of Sudbury and Timiskaming (41 P/10,11,14,15); by M.W. Carter, 74p. Accompanied by Map 2465, scale 1:31 680. (Stock No. 6439)

Report 227
Geology of the Squaw Lake-Sturgeon Lake Area, District of Thunder Bay (52 J/1,2); by N.F. Trowell, 114p. Accompanied by Map 2420, scale 1:31 680. (Stock No. 6441)

Report 229
Geology of the Rotunda Lake-Percy Lake Area, Districts of Algoma and Sudbury (NTS 41 N/8, 41 O/5); by B.C. Wilson, 32p. Accompanied by Map 2478, scale 1:31 680 or 1 inch to ½ mile. (Stock No. 6443)

Report 230
Geology of Harvey Township, Peterborough County (31 D/7,8,9,10); by R.L. Morton, 50p. Accompanied by Map 2475, scale 1:31 680 or 1 inch to ½ mile. (Stock No. 6444)

Report 233
Geology of the Matchinameigus Lake Area, District of Algoma (42 C/1); by M.J. Downes, 40p. Accompanied by Map 2483, scale 1:31 680 or 1 inch to ½ mile. (Stock No. 6447)

## Miscellaneous Papers

MP 77 (1982 Supplement)
Index to Published Reports and Maps, 1982 Supplement; prepared by staff of Geoscience Data Centre, Ontario Geological Survey, 43p. (Stock No. 6798) *(NOGS)*

MP 104
Geology of the Quinn Lake Area, District of Algoma; by G.M. Siragusa, 11p. (Stock No. 6792)

MP 107
Report of Activities, Regional and Resident Geologists, 1982; edited by C.R. Kustra, 211p. Accompanied by 1982 Supplement to Bulletin 25, List of Publications. (Stock No. 6795)

MP 108
The Ten-Year History and Index of the Ontario Mineral Exploration Assistance Program (MEAP) 1971-1981; by S.V. Burr, 196p. (Stock No. 6796) *(NOGS)*

MP 109
Geology of the Ferdinand Lake Area, District of Kenora, Patricia Portion; by Henry Wallace, 10p. (Stock No. 6797)

MP 110
The Geology of Gold in Ontario; edited by A.C. Colvine, 278p. (Stock No. 6799)

MP 111
19th Forum on the Geology of Industrial Minerals, Guidebook for Field Trips; edited by S.E. Yundt, 48p. (Stock No. 6800)

MP 112
Slope Stability of the South Nation River and Portions of the Ottawa River; by A.S. Poschmann, K.E. Klassen, M.A. Klugman, and D. Goodings, 20p. Accompanied by Geotechnical Series Maps 2486 and 2487, scale 1:50 000. (Stock No. 6801) *(South Nation)*

MP 113
Geoscience Research Grant Program, Summary of Research 1982-1983; edited by E.G. Pye, 199p. (Stock No. 6802)

MP 114
19th Forum on the Geology of Industrial Minerals, Proceedings; edited by S.E. Yundt, 216p. (Stock No. 6803)

MP 115
Exploration Technology Development Program of the Board of Industrial Leadership and Development, Summary of Research 1981-1983; edited by E.G. Pye and R.B. Barlow, 135p. Accompanied by 2 charts (coloured). (Stock No. 6804) *(BILD)*

MP 116
Summary of Field Work, 1983, by the Ontario Geological Survey; edited by John Wood, Owen L. White, R.B. Barlow, and A.C. Colvine, 313p. (Stock No. 6805)

## Industrial Mineral Report

IMR 33 (reprint)
A Guide to Site Development and Rehabilitation of Pits and Quarries; by Anthony M. Bauer, 62p. (Stock No. 6981)

## Studies

Study 24
Bedrock and Overburden Geochemistry Investigations in the Midlothian Lake and Natal Lake Areas, Districts of Sudbury and Timiskaming; by L.G. Closs and E.V. Sado, 68p. Accompanied by 5 charts. (Stock No. 6678)

Study 25
Results of Surtrace Geochemical Surveys over the Marathon and Marshall Lake Areas, District of Thunder Bay; by D.R. Clews and R.E. Lett, 61p. Accompanied by eleven charts. (Stock No. 6677) *(NOGS)*

Study 26
Gold Exploration in the Timmins Area Using Field and Lithogeochemical Characteristics of Carbonate Zones; by J. Andy Fyon and J.H. Crocket, 56p. Accompanied by 2 charts and 2 maps. (Stock No. 6676)

## Guidebook

GB 6
Geology and Scenery, Killarney Provincial Park Area, Ontario; by R.L. Debicki, 152p. (Stock No. 7994)

## Aggregate Resources Inventory Papers

ARIP 46
Aggregate Resources Inventory of the Town of Halton Hills, Re-

gional Municipality of Halton, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 37p., 6 tables, 3 maps, scale 1:50 000. (Stock No. 7045)

ARIP 55
Aggregate Resources Inventory of London Township, Middlesex County, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 37p., 6 tables, 3 maps. (Stock No. 7054)

ARIP 63
Aggregate Resources Inventory of the Township of East Zorra-Tavistock, Oxford County, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 33p., 7 tables, 3 maps, scale 1:50 000. (Stock No. 7062)

ARIP 66
Aggregate Resources Inventory of the Township of Blandford-Blenheim, Oxford County, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 45p., 7 tables, 3 maps, scale 1:50 000. (Stock No. 7067)

ARIP 76
Aggregate Resources Inventory of Delaware Township, Middlesex County, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 32p., 7 tables, 3 maps, scale 1:50 000. (Stock No. 7075)

ARIP 89
Aggregate Resources Inventory of the Central Part of the City of Timmins, Cochrane District, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 49p., 8 tables, 3 maps, scale 1:50 000. (Stock No. 7088)

ARIP 90
Aggregate Resources Inventory of the Eastern Part of the City of Timmins, Cochrane District, by the staff of the Aggregate Assessment Office, Engineering and Terrain Geology, Ontario Geological Survey, 43p., 7 tables, 3 maps, scale 1:50 000. (Stock No. 7089)

ARIP 92
Aggregate Resources Inventory of the Fort Frances Area, Rainy River District, by staff of the Aggregate Assessment Office, Engineering and Terrain Geology Section, Ontario Geological Survey, 42p., 7 tables, 3 maps, scale 1:50 000. (Stock No. 7091)

## Northern Ontario Engineering Geology Terrain Studies

NOEGTS 7
Whitewater Lake Area, Thunder Bay District (52 I/NW), by A.J. Cooper, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 17p. Accompanied by Map 5117, scale 1:100 000. (Stock No. 7306)*(NOGS)*

NOEGTS 8
Mojikit Lake Area, Thunder Bay District (52 I/NE); by A.J. Cooper, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 20p. Accompanied by Map 5118, scale 1:100 000. (Stock No. 7307) *(NOGS)*

NOEGTS 9
Ogoki Lake Area, Thunder Bay District (42 L/NW); by A.J. Cooper, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 19p. Accompanied by Map 5122, scale 1:100 000. (Stock No. 7308) *(NOGS)*

NOEGTS 10
Percy Lake Area, Thunder Bay and Cochrane Districts (42 L/NE), by J.E. Haynes, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 16p. Accompanied by Map 5123, scale 1:100 000. (Stock No. 7309) *(NOGS)*

NOEGTS 16
Armstrong Area, Thunder Bay District (52 I/SW), by D.F. McQuay, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 24p. Accompanied by Maps 5119 and 5121, scale 1:100 000. (Stock No. 7315) *(NOGS)*

NOEGTS 17
Windigo Bay Area, Thunder Bay District (52 I/SE), by D.F. McQuay, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 18p. Accompanied by Map 5120, scale 1:100 000. (Stock No. 7316) *(NOGS)*

NOEGTS 18
Onaman Lake Area, Thunder Bay District (42 L/SW), by A.J. Cooper, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 21p. Accompanied by Map 5124, scale 1:100 000. (Stock No. 7317) *(NOGS)*

NOEGTS 19
Nakina Area, Thunder Bay District (42 L/SE), by A.J. Cooper, Gartner Lee Associates Limited, for the Ontario Ministry of Natural Resources, 26p. Accompanied by Maps 5125 and 5126, scale 1:100 000. (Stock No. 7318) *(NOGS)*

NOEGTS 25
Gull River Area, Thunder Bay District (52 H/NW); by D.G. Mollard and J.D. Mollard, J.D. Mollard and Associates Limited, for the Ontario Ministry of Natural Resources, 34p. Accompanied by Maps 5049, 5052, and 5054, scale 1:100 000. (Stock No. 7324) *(NOGS)*

NOEGTS 71
Thunder Bay Area, Thunder Bay District (52 A/SW); by D.G. Mollard and J.D. Mollard, J.D. Mollard and Associates Limited, for the Ontario Ministry of Natural Resources, 41p. Accompanied by Maps 5047 and 5048, scale 1:100 000. (Stock No. 7370) *(NOGS)*

## Miscellaneous Publications

Index to Preliminary Maps - Geochemical, Geophysical and Data Series, Northwestern Ontario. Compilation by Linda Christiansen and Renate Simon, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 306)

Index to Preliminary Maps - Geochemical, Geophysical and Data Series, Northeastern Ontario. Compilation by Linda Christiansen and Renate Simon, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 307)

Index to Preliminary Maps - Geochemical, Geophysical and Data Series, Southern Ontario. Compilation by Linda Christiansen and Renate Simon, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 308)

Index to the Out-of-Print Published Maps of Ontario, Northwestern Sheet. Compilation by C.A. Dudar and Linda Christiansen, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 309)

Index to the Out-of-Print Published Maps of Ontario, Northeastern Sheet. Compilation by C.A. Dudar and Linda Christiansen, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 310)

Index to the Out-of-Print Published Maps of Ontario, Southern Sheet. Compilation by C.A. Dudar and Linda Christiansen, Scientific Review Office, Ontario Geological Survey. Basemap scale 1:1 013 760 or 1 inch to 16 miles. (Stock No. 11 311)

Rocks and Minerals Information, 1983, by staff of the Ontario Geological Survey. This booklet contains numerous sources of information on the earth sciences. (Stock No. 5409)

When Time is Old, 12p. This booklet describes briefly the geochronology program jointly conducted by the Ontario Geological Survey and the Royal Ontario Museum. Some of the most significant results to emerge from the program are mentioned, and a number of the implications of the work discussed. (Stock No. 5344) *(NOGS)*

How to Find Reports and Maps - Your Guide to MP77, Index to Published Reports and Maps, Mineral Resources Group. This booklet is a quick and easy-to-use reference tool designed for users of MP77, showing how to zero in on publications of interest to the reader. (Stock No. 5402)

## Open File Reports

OFR 5333
Index to Geoscience Data Recorded in Exploration Reports Submitted by the Mining Industry, Edition 1983; compiled by S. Sun and T. Pauk, Geoscience Data Centre, Ontario Geological Survey. *(NOGS)*

OFR 5363
Depositional Characteristics of the Whirlpool Sandstone, Lower Silurian, Ontario; by I. Peter Martini and C. Salas, 124p., 5 tables, numerous figures and photos.

OFR 5383
Geochemical Data: Manitoulin Island Limestone-Dolostone Assessment Project; by M.D. Johnson, 98p., 7 figures, and 6 maps. *(NOGS)*

OFR 5386
Industrial Minerals of Northern Ontario; by M.A. Vos, Tanya Abolins, R.I.W. McKnight, and Violet Smith, 1483p., and 3 figures. *(NIMS)*

OFR 5425
Industrial Minerals of the Algonquin Region; by Wendy Martin, 316p. Accompanied by Maps P.2562, P.2563, P.2564, P.2565, P.2566, and P.2567, scale 1:15 840.

OFR 5426
Geology of the Morgan Lake-Nelson Lake Area, District of Sudbury; by T.L. Muir, 204p., 21 tables, 21 figures, 15 photos, and 3 maps. *(NOGS)*

OFR 5427
Bore Hole Mining of Silica Sand and Kaolinite Clay in the James Bay Lowlands, Ontario; Feasibility and Cost Analysis; by Derry, Michener, Booth and Wahl and IMD Laboratories Limited, 73p., 10 tables, 4 figures, and 1 map. *(NIMS)*

OFR 5428
Quaternary Geology of the Bancroft Area; by P.J. Barnett, 124p., 4 tables, 15 figures, 14 photos, and 2 maps, P.2396, P.2397.

OFR 5429
Quaternary Geology of the Hamilton-Cambridge Area; by P.F. Karrow, 160p., 15 figures, 4 tables, and 20 photos. Accompanied by Preliminary Maps P.2604 and P.2605, scale 1:50 000.

OFR 5430
Huronian Geology and the Blind River Uranium Deposits; by James A. Robertson, 99p., 5 tables, and 16 figures.

OFR 5431
Mineral Resources of South-Central Ontario; by G.R. Guillet, 155p., 9 tables, 20 figures, 11 photos.

OFR 5432
Sand and Gravel Assessment for the United Counties of Leeds and Grenville; by A.F. Young, G.A. Gorrell, and T.W. Fletcher, 61p., 1 figure, 21 tables, and 3 maps. *(SOGS)*

OFR 5433
Sand and Gravel Assessment for the United Counties of Prescott and Russell; by G.A. Gorrell and T.W. Fletcher, 38p., 1 figure, 11 tables, and 2 maps. *(SOGS)*

OFR 5434
Sand and Gravel Assessment for the United Counties of Stormont, Dundas and Glengarry; by G.A. Gorrell and T.W. Fletcher. *(SOGS)*

OFR 5437
Geology of the Greenwich Lake Area, Thunder Bay District; by M.W. Carter, 49p. 8 tables, 8 photos, 2 figures.

OFR 5438
Garnet Lake Area, Sudbury District; by G.M. Siragusa, 148p., 15 tables, 8 photos, and 8 figures.

OFR 5439
Industrial Minerals of Northern Ontario - Supplement 2; by M.A. Vos and V. Smith, 500p. and 3 figures. *(NIMS)*

OFR 5440
Ontario Geoscience Research Grant Program, Grant No. 109 - An Interpretation of Gravity Data from New Liskeard, Ontario; by David A. Wilkinson and L. Mansinha, 196p., 5 appendices, 4 tables, and 6 figures.

OFR 5441
Ontario Geoscience Research Grant Program, Grant No. 2 - A Structural Petrochemical Study of Gold Ore Formation at Red Lake, Ontario; by C. Jay Hodgson, 59p. and 19 maps.

OFR 5442
Ontario Geoscience Research Grant Program, Grant No. 62 - The Direct Dating of Ore Minerals; by Derek York, A. Masliwec, P. Kuybida, C.M. Hall, W. John Kenyon, J.A. Hanes, E.T.C. Spooner, and S.D. Scott, 149p., 5 tables, and 7 figures.

OFR 5443
Ontario Geoscience Research Grant Program, Grant No. 96 - Nature and Origin of Mineralization inside the Sudbury Basin; by D.H. Rousell, 53p., 4 tables, and 7 figures.

OFR 5444
Ontario Geoscience Research Grant Program, Grant No. 76 - Speciation of Free Gold in Glacial Overburden; by D.L. Guindon and I. Nichol, 15p., 2 tables, 6 figures, and 4 appendices.

OFR 5445
Westree Sand Deposit, Westbrook and Garvey Townships, Sudbury District; by G.R. Guillet, 77p., 2 tables, 3 figures, and 2 appendices. *(NORDA)*

OFR 5446
Preliminary Report of the Building and Ornamental Stone Inventory, Districts of Kenora and Rainy River; by C.C. Storey, 143p., 20 tables, and 37 figures. *(NORDA)*

OFR 5447
Ontario Geoscience Research Grant Program, Grant No. 5 - Part I. Component Magnetization of Algoman Banded Formations

and Deposits in Ontario; by D.T.A. Symons and M. Stupavsky. Part II. Magnetization Characteristics of the Algoman Iron Formation and Host Rocks at the Griffith Mine, Red Lake, Ontario; by D.T.A. Symons, I.A. Osmani, and M. Stupavsky, 57p.

OFR 5448
Peat and Peatland Evaluation of the Peterborough Area; prepared by Bird and Hale Limited for the Ontario Ministry of Natural Resouces, 105p. and several maps. *(HERP)*

OFR 5449
Peat and Peatland Evaluation of Pembroke Area, Volume 1 and 2; by Environmental Services for Planning Limited, for the Ontario Ministry of Natural Resources, 85p. and numerous maps. *(HERP)*

OFR 5450
Peat and Peatland Evaluation of Hearst Area, Volumes 1 and 2; by Dendron Resource Surveys Limited, for the Ontario Ministry of Natural Resources, 129p. and numerous maps. *(HERP)*

OFR 5452
Peatland Inventory Project: Laboratory Analyses 1982/83-Hearst, Armstrong, Peterborough and Pembroke Areas; by J.L. Riley, 112p. 4 figures, and 5 tables. *(HERP)*

OFR 5453
A Comparative Geochemical Study of Some Peatlands of Northern Ontario: Preliminary Report; by W. Shotyk and P.G. Telford, 291p., 5 tables, and 5 appendices. *(HERP)*

OFR 5455
Geology and Petrogenesis of the Archean Abitibi Belt in the Kirkland Lake Area, Ontario; by L.S. Jensen and F.F. Langford, 520p., 9 tables, 106 figures, and 2 maps.

OFR 5456
Deep Overburden Drilling and Geochemical Sampling in Hearst, Catherine, McElroy, Gauthier, Arnold, Clifford and Bisley Townships, Districts of Timiskaming and Cochrane; by S.A. Averill and J.A.C. Fortescue, 315p., 5 appendices, 5 tables, and 32 figures. *(KLIP)*

OFR 5457
Aggregate Resources Assessment, District of Muskoka; by the staff of Algonquin Region, 14p. and 12 maps.

OFR 5458
Oil Shale Assessment Project, Volume 1 - Shallow Drilling Results 1981/82; by M.D. Johnson, D.J. Russell and P.G. Telford, 36p., 9 figures, and 15 Geophysical Logs in back pocket. *(HERP)*

OFR 5459
Oil Shale Assessment Project, Volume 2 - Drill Holes for Regional Correlation 1981/82; by M.D. Johnson, D.J. Russell, and P.G. Telford, 20p., 4 figures, and 2 Geophysical Logs in back pocket. *(HERP)*

OFR 5460
Oil Shale Assessment Project, Volume 3, Organic Geochemical Results 1981/82; by J.F. Barker, D.J. Russell, M.D. Johnson, and P.G. Telford, 36p. and 2 figures. *(HERP)*

OFR 5462
Ontario Geoscience Research Grant Program, Grant No. 82 - Structural Controls of Uranium Ore-Bodies in the Madawaska Mines, Bancroft Area; by R.L. Bedell and W.M. Schwerdtner, 90p., 3 maps, numerous figures and tables, and 4 appendices.

OFR 5463
Ontario Geoscience Research Grant Program, Grant No. 78 - Terrain Characteristics and Physical Processes in Small Lagoon Complexes; by J.E. Otto and R.W. Dalrymple, 89p. 5 tables, and 7 figures.

OFR 5464
Ontario Geoscience Research Grant Program, Grant No. 49 - Application of Stable Isotope Studies to Gold Metallogeny in the Timmins-Porcupine Camp; by J.A. Fyon, J.H. Crocket, and H.P. Schwarcz, 182p., 9 tables, 23 figures, and 16 maps.

OFR 5465
Preliminary Report on Seismic Investigations in Central Region, 1982, by L.G.D. Thompson and J.M. Brand, 155p. and 36 figures.

OFR 5466
Exploration Technology Development Fund, Grant No. 005 - In-Field Tin-Tungsten Analysis; by J.D. Kinrade and J.C. Robbins, Scintrex Limited, for the Ontario Ministry of Natural Resources, 37p., 7 tables, and 11 figures.

OFR 5467
Preliminary Report on the Timmins-Kirkland Lake Area Gold Deposits File; by C.J. Hodgson, 434p., 17 tables, 40 figures, 11 maps, and 9 appendices.

OFR 5468
Exploration Technology Development Fund, Grant No. 004 - Characterization of Electrical Properties of Metallic Mineral Deposits; by Phillip G. Hallof, Ph.D., and James D. Klein, Ph.D., Phoenix Geophysics Limited, for the Ontario Ministry of Natural Resources, 113p. and numerous figures.

OFR 5469
A Report on Geophysical Surveys Conducted in the Beardmore-Geraldton Greenstone Belt; by Dave Marcotte and Blaine Webster, Scintrex Limited, for the Ontario Ministry of Natural Resources, 36p., 3 tables, 6 figures, and 3 appendices. *(NORDA)*

OFR 5472
The Mechanical Properties of Oil Shales by Maurice B. Dusseault, K. Lee Bradshaw, Kim Ehret, and Matthias Loftsson, 78p., 16 figures, and 3 tables. *(HERP)*

OFR 5473
Ontario Geoscience Research Grant Program, Grant No. 68 - Model Study of Archean Greenstone-Granite Gneiss Belts, Final Report: Centrifuged Model Study of the Tectonic Development of Archean Belts; by John M. Dixon and John M. Summers, 55p. and 16 figures.

OFR 5474
Ontario Geoscience Research Grant No. 105 - Latter-Stage Decay Products of $^{222}$Rn - Use in Radioactive Waste Management and Uranium Exploration; by J.W. Card and Keith Bell, 19p. and 9 figures.

OFR 5475
Ontario Geoscience Research Grant No. 112 - Petrographic Number Re-Evaluation; by Peter P. Hudec, 34p., 7 tables, and 5 figures.

OFR 5476
Ontario Geoscience Research Grant Program, Grant No. 143 - Analysis of Aeromagnetic Anomalies Over Algoman-Type Iron Formations; by D.T.A. Symons and M. Stupavsky, 90p., 1 figure, 2 tables, and 1 appendix.

OFR 5477
Oil Shale Assessment Project, Deep Drilling Results 1982/83, Toronto Region; by M.D. Johnson, 17p., and 3 Geophysical Logs in back pocket. *(HERP)*

OFR 5478
Geology of the Hill Lake Area, District of Timiskaming; by G.W. Johns, 170p., 2 tables, 17 figures, and 6 photos. *(NOGS)*

OFR 5479
Summary and Analysis of a Questionnaire on the Publications Output of the Ontario Geological Survey; by E.G. Pye. 56p

## Coloured Geological Maps

Map 2422
Bag Bay, Kenora District (52 E/10, 52 E/11). Geology by J.C. Davies and assistants, 1968, 1969. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 618)

Map 2452 (reprint)
Hemlo, Thunder Bay District (42 D/9, 42 C/12). Geology by T.L. Muir, J. Lafleur, and assistants, 1978. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 648)

Map 2459
Pembroke, Southern Ontario (31 F/NW). Geology by S.B. Lumbers and assistants, 1974-78. Scale 1:100 000. (Stock No. 10 655) *(Pembroke-Renfrew)*

Map 2460
Cobden, Southern Ontario (31 F/NE). Geology by S.B. Lumbers and assistants, 1974-78. Scale 1:100 000. (Stock No. 10 656) *(Pembroke-Renfrew)*

Map 2461
Barry's Bay, Southern Ontario (31 F/SW). Geology by S.B. Lumbers and assistants, 1974-78. Scale 1:100 000. (Stock No. 10 657) *(Pembroke-Renfrew)*

Map 2462
Renfrew, Southern Ontario (31 F/SE). Geology by S.B. Lumbers and assistants, 1974-78. Scale 1:100 000. (Stock No. 10 658) *(Pembroke-Renfrew)*

Map 2465
Natal and Knight Townships, Sudbury and Timiskaming Districts (41 P/10, 41 P/11, 41 P/14, 41 P/15). Geology by M.W. Carter and assistants, 1974. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 661)

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Harvey Township, Peterborough County. Geology by R.L. Morton and assistants, 1978. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 671)

Map 2476
Upper Manitou Lake-Sunshine Lake, Kenora District (52 F/7). Geology by C.E. Blackburn, 1976. Scale 1:50 000. (Stock No. 10 672)

Map 2477
Loggers Lake, Kenora District (52 G/13). Geology by N.F. Trowell, J.R. Bartlett, and R.H. Sutcliffe, 1977-1978. Scale 1:50 000. (Stock No. 10 673)

Map 2478
Rotunda Lake-Percy Lake Area, Algoma and Sudbury Districts (NTS 41 N/8, 41 O/5). Geology by B.C. Wilson and assistants, 1979. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 674)

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Wesleyan Lake Area, Kenora District (NTS 52 O/4, 52 O/5). Geology by Henry Wallace and assistants, 1977-8. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 677)

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Moosetegon Lake Area, Kenora District (NTS 52 O/3, 52 O/6). Geology by Henry Wallace and assistants, 1977-8. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 678)

Map 2483
Matchinameigus Lake, Algoma District (42 C/1). Geology by M.J. Downes and assistants, 1978. Scale 1:31 680 or 1 inch to ½ mile. (Stock No. 10 679)

Map 2486
Slope Stability Study of the South Nation River and Portions of the Ottawa River, Northern Sheet (31 G/2,3,4,5,6,7,10,11,12). Slope stability study by A.S. Poschmann, K.E. Klassen, M.A. Klugman, and D. Goodings, September 1978. Scale 1:50 000. (Stock No. 10 682) *(South Nation)*

Map 2487
Slope Stability Study of the South Nation River and Portions of the Ottawa River, Southern Sheet (31 B/13,14,15; 31 G/2,3,4). Slope stability study by A.S. Poschmann, K.E. Klassen, M.A. Klugman, and D. Goodings, September 1978. Scale 1:50 000. (Stock No. 10 683) *(South Nation)*

## Northern Ontario Engineering Geology Terrain Study Maps

Map 5047
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Thunder Bay (52 A/SW); by D.G. Mollard, J.D. Mollard and Associates Limited, 1977, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 953) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Light Construction Capability Map, Thunder Bay (52 A/SW); by D.G. Mollard, J.D. Mollard and Associates, 1977, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 952) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Data Base Map, Gull River (52 H/NW); by D.G. Mollard, J.D. Mollard and Associates Limited, 1977, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 951) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Groundwater Development Capability Map, Gull River (52 H/NW); by D.G. Mollard, J.D. Mollard and Associates Limited, 1977, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 947) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Solid Waste Disposal Capability Map, Gull River (52 H/NW); by D.G. Mollard, J.D. Mollard and Associates Limited, 1977, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 946) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Data Base Map, Whitewater Lake (52 I/NW); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 883) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Data Base Map, Mojikit Lake (52 I/NE); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 882) *(NOGS)*

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Northern Ontario Engineering Geology Terrain Study, Data Base Map, Armstrong (52 I/SW); by D.F. McQuay, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 881) *(NOGS)*

Map 5120
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Windigo Bay (52 I/SE); by D.F. McQuay, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 880) *(NOGS)*

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Northern Ontario Engineering and Terrain Study, Sand and Gravel Resources Map, Armstrong (52 I/SW); by D.F. McQuay, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 879) *(NOGS)*

Map 5122
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Ogoki Lake (42 L/NW); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 878) *(NOGS)*

Map 5123
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Percy Lake (42 L/NE); by J.E. Haynes, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 877) *(NOGS)*

Map 5124
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Onaman Lake (42 L/SW); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 876) *(NOGS)*

Map 5125
Northern Ontario Engineering Geology Terrain Study, Data Base Map, Nakina (42 L/SE); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 875) *(NOGS)*

Map 5126
Northern Ontario Engineering Geology Terrain Study, Mineral Exploration Capability Map, Nakina (42 L/SE); by A.J. Cooper, Gartner Lee Associates Limited, 1979, for the Ontario Ministry of Natural Resources. Scale 1:100 000. (Stock No. 14 874) *(NOGS)*

## Preliminary Maps and P. Number Series Maps

P.1068 (revised 1983)
Precambrian Geology of the Chipman Lake Area, Thunder Bay and Cochrane Districts (42 E/16). Geology by R.P. Sage, D. Bathe, and W. Wright, assisted by P. Chamois and K. Shewbridge, 1975. Scale 1:15 840 or 1 inch to ¼ mile.

P.1519 (reprint)
Ontario Mineral Potential, White River Sheet, Thunder Bay and Algoma Districts (42 C). Compiled from published and unpublished maps and reports of the Division of Mines, Ontario Ministry of Natural Resources, and the Geological Survey of Canada. Scale 1:250 000. (Stock No. 11 819)

P.2345 (revised 1983)
Precambrian Geology of the Ferdinand Lake Area, Western Part, Kenora District (Patricia Portion) (52 N/1E). Geology by Henry Wallace and assistants, 1979. Scale 1:15 840 or 1 inch to ¼ mile.

P.2346 (revised 1983)
Precambrian Geology of the Ferdinand Lake Area, Eastern Part, Kenora District (Patricia Portion) (52 O/4W). Geology by Henry Wallace and assistants, 1979. Scale 1:15 840 or 1 inch to ¼ mile.

P.2503
Sand and Gravel Assessment of Leeds County, North Half, United Counties of Leeds and Grenville. Field study and compilation by A.F. Young, T.W. Fletcher, M. Johnston, and D. Hall, Ontario Ministry of Natural Resources, Eastern Region, Kemptville 1979-1980. Scale 1:50 000. (Stock No. 12 124)

P.2504
Sand and Gravel Assessment of Leeds County, South Half, United Counties of Leeds and Grenville. Field study and compilation by A.F. Young, T.W. Fletcher, M. Johnston, and D. Hall, Ontario Ministry of Natural Resources Eastern Region, Kemptville, 1979-1980. Scale 1:50 000. (Stock No. 12 125)

P.2505
Sand and Gravel Assessment of Grenville County, United Counties of Leeds and Grenville. Field study and compilation by G.A. Gorrell, T.W. Fletcher, and R.D. Trotter, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1978-1980. Scale 1:50 000. (Stock No. 12 126)

P.2506
Sand and Gravel Assessment of Stormont County, United Counties of Stormont, Dundas and Glengarry. Field study and compilation by G.A. Gorrell, T.W. Fletcher, and R.D. Trotter, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1978-1980. (Stock No. 12 127)

P.2507
Sand and Gravel Assessment of Dundas County, United Counties of Stormont, Dundas and Glengarry. Field study and compilation by G.A. Gorrell, T.W. Fletcher, and R.D. Trotter, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1978-1980. Scale 1:50 000. (Stock No. 12 128).

P.2508
Sand and Gravel Assessment of Glengarry County, United Counties of Stormont, Dundas and Glengarry. Field study and compilation by G.A. Gorrell, T.W. Fletcher, and R.D. Trotter, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1978-1980. Scale 1:50 000. (Stock No. 12 131)

P.2509
Sand and Gravel Assessment of Prescott County, United Counties of Prescott and Russell. Field study and compilation by G.A. Gorrell, T.W. Fletcher, R.D. Trotter, and G.R. Long, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1978-1980. Scale 1:50 000. (Stock No. 12 132)

P.2510
Sand and Gravel Assessment of Russell County, United Counties of Prescott and Russell. Field study and compilation by G.A. Gorrell, T.W. Fletcher, R.D. Trotter, and G.R. Long, Ontario Ministry of Natural Resources, Eastern Region, Kemptville, 1979-1980. Scale 1:50 000. (Stock No. 12 133)

P.2582
Quaternary Geology of the Dana Lake Area, Districts of Cochrane, Timiskaming and Sudbury (42 A/5). Geology by C.M. Tucker, J.A. Richard, and assistants, 1980. Scale 1:50 000. *(NOGS)*

P.2583
Bedrock Topography of the Port Burwell Area, Southern Ontario (40 I/10). Compilation by P.J. Barnett and J.M. Sando, 1982. Scale 1:50 000.

P.2584
Bedrock Topography of the Long Point Area, Southern Ontario (40 I/9). Compilation by P.J. Barnett and S.L. Waters, 1982. Scale 1:50 000.

P.2585
Quaternary Geology of the Ear Falls Area, Kenora District (Patricia Portion) (52 K/11). Geology by M.J. Ford and assistants, 1981. Scale 1:50 000.

P.2588
Quaternary Geology of the Bath-Yorkshire Island Area, Southern Ontario (31 C/2; 30 N/15). Geology by J.G. Leyland, T.S. Russell, and assistants, 1982. Scale 1:50 000 *(SOGS)*

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Drift Thickness of the Port Burwell Area, Southern Ontario (41 I/10). Compilation by P.J. Barnett, A.F. Bajc, and J.M. Sando, 1982. Scale 1:50 000.

P.2590
Drift Thickness of the Long Point Area, Southern Ontario (40 I/9). Compilation by P.J. Barnett and A.F. Bajc, 1982. Scale 1:50 000.

P.2591
Industrial Minerals of Ontario. Compiled by S.E. Yundt, D.G. Minnes, J.S. Masham, D.W. Scott, and M.A. Vos. Scale 1:1 500 000. (Stock No. 12 160)

P.2592
Precambrian Geology of Kirby Township, Thunder Bay District (42 E/14). Geology by G.P. Beakhouse, P. Chevalier, and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

P.2593
Precambrian Geology of Fulford and McQuesten Townships, Thunder Bay District (42 E/14W, 15E). Geology by G.P. Beakhouse, P. Chevalier, and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

P.2594
Precambrian Geology of the Long Bay-Lobstick Bay Area, Western Part, Kenora District (52 E/8E). Geology by G.W. Johns, J.G. Davison, and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

P.2595
Precambrian Geology of the Long Bay-Lobstick Bay Area, Eastern Part, Kenora District (52 F/5W, 12W). Geology by G.W. Johns, J.G. Davison, and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

P.2596
Quaternary Geology of the Fenelon Falls Area, Southern Ontario (31 D/10). Geology by P.F. Finamore and A.J. Bajc, 1981, 1982. Scale 1:50 000.

P.2597
Precambrian Geology of the Centre Lake Area (Western Part), Haliburton and Hastings Counties (31 E/1). Geology by E.G. Bright and assistants, 1979. Scale 1:15 840 or 1 inch to ¼ mile.

P.2598
Precambrian Geology of the Centre Lake Area (Eastern Part), Haliburton and Hastings Counties (31 E/1). Geology by E.G. Bright and assistants, 1979. Scale 1:15 840 or 1 inch to ¼ mile.

P.2599
Precambrian Geology of Hart Township, Sudbury District (41 I/12E). Geology by A.G. Choudhry and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile. *(NOGS)*

P.2600
Precambrian Geology of Ermatinger Township, Sudbury District (41 I/12E). Geology by A.G. Choudhry and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile. *(NOGS)*

P.2601
Precambrian Geology of Totten Township, Sudbury District (41 I/5E, 12E). Geology by A.G. Choudhry and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile. *(NOGS)*

P.2602
Sudbury Mining Area, Western Part, Sudbury District (41 I/5,6,11,12,13,14). Compilation by Burkhard O. Dressler, 1982, 1983. Scale 1:50 000.

P.2603
Sudbury Mining Area, Eastern Part, Sudbury District (41 I/6,7,10,11,14,15). Compilation by Burkhard O. Dressler, 1982, 1983. Scale 1:50 000.

P.2604
Quaternary Geology of the Cambridge Area, Southern Ontario (40 P/8). Geology by P.F. Karrow and assistants, 1958, 1959, with additional work in the 1960s and 1970s. Scale 1:50 000.

P.2605
Quaternary Geology of the Hamilton Area, Southern Ontario (30 M/5). Geology by P.F. Karrow and assistants, 1958, 1959, with additional work in the 1960s and 1970s. Scale 1:50 000.

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Precambrian Geology of Brunswick Township, District of Sudbury (41 P/11,12). Geology by G.M. Siragusa and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

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Quaternary Geology of Algonquin Park, Northwestern Part, Nipissing District (31 E/14, 15; 31 L/2, 3). Geology by R.S. Geddes, M.B. McClenaghan, and assistants, 1982. Scale 1:50 000.

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Quaternary Geology of Algonquin Park, Northeastern Part, Nipissing District and Renfrew County (31 F/12, 13; 31 K/4). Geology by M.J. Ford, R.A. Lall, and assistants, 1982. Scale 1:50 000.

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Precambrian Geology of the Lavant Area, Frontenac and Lanark Counties (31 F/2E). Geology by L. Pauk and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile. *(SOGS)*

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Precambrian Geology of Marmora Township, Northern Part, Hastings County (31 C/5, 12). Geology by J.R. Bartlett, J.M. Moore Jr., and assistants, 1981. Scale 1:15 840 or 1 inch to ¼ mile. *(SOGS)*

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Precambrian Geology of Marmora Township, Southern Part, Hastings County (31 C/5, 12). Geology by J.R. Bartlett, J.M. Moore Jr., and assistants, 1981. Scale 1:15 840 or 1 inch to ¼ mile. *(SOGS)*

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Precambrian Geology of the Wicklow Area, Hastings County (31 F/5W). Geology by F.W. Breaks, R.H. Thivierge, and assistants, 1982. Scale 1:15 840 or 1 inch to ¼ mile. *(SOGS)*

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Quaternary Geology of the Tweed Area, Southern Ontario (31 C/6). Geology by J.G. Leyland, M. Mihychuk, and assistants, 1981. Scale 1:50 000. *(SOGS)*

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Quaternary Geology of the Long Point Area, Southern Ontario (40 I/9). Geology by P.J. Barnett and A. Zilans, 1982, 1983. Scale 1:50 000.

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Precambrian Geology of the Kenora-Keewatin Area, Western Part, Kenora District (52 E/15,16). Geology by H.L. King and assistants, 1968, 1969. Marginal notes and drafting by H.L. King and J.R. Foster, 1983. Scale 1:15 840 or 1 inch to ¼ mile.

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Precambrian Geology of the Kenora-Keewatin Area, Eastern Part, Kenora District (52 E/15,16). Geology by H.L. King and assistants, 1968, 1969. Marginal notes and drafting by H.L. King and J.R. Foster, 1983. Scale 1:15 840 or 1 inch to ¼ mile.

P.2619

Precambrian Geology of the Meen Lake Area, Western Part, Kenora District (Patricia Portion) (52 O/5,6). Geology by G.M. Stott and C. LaRocque, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

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Precambrian Geology of the Meen Lake Area, Eastern Part, Kenora District (Patricia Portion) (52 O/6). Geology by G.M. Stott and C. LaRocque, 1982. Scale 1:15 840 or 1 inch to ¼ mile.

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Quaternary Geology of the Port Burwell Area, Southern Ontario (40 I/10). Geology by P.J. Barnett and assistants, 1982, 1983. Scale 1:50 000.

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Quaternary Geology Kamiskotia Lake Area, Cochrane District (42 A/12). Geology by J.A. Richard, 1982. Scale 1:50 000. *(NOGS)*

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Quaternary Geology Pamour Area, Cochrane District (42 A/11). Geology by J.A. Richard, 1982. Scale 1:50 000. *(NOGS)*

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Precambrian Geology of Lendrum Township, Algoma District (41 N/15; 42 C/2). Geology by N.W.D. Massey and assistants, 1983. Scale 1:15 840. *(NORDA)*

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## Geophysical-Geochemical Series Map

Map 80 612

The Southwest Ontario Geochemical Survey As An Example of the Micromodule Approach to Regional Geochemical Mapping, Southern Ontario (30 L; 30 M; 40 I; 40 P). Compiled by J.A.C. Fortescue, 1983. (Stock No. 11 954)

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## Mineral Policy Background Papers

MPBP 16
Ontario Metal Mining Statistics; by the staff of the Mineral Resources Branch, and the staff of the Centre for Resource Studies, Ontario Ministry of Natural Resources. 169p. Released March 10, 1983. (Stock No. 5329)

MPBP 17
An Update on the Ontario Ministry of Natural Resources Model of the World Markets for Copper, Aluminum, Nickel, and Zinc; by C.W. Smithson and assistants. 116p. (Stock No. 5388)

## Video Census Series

Video Census Series No. 21982 Ontario Mineral Score, by G L Weatherson, 268p. Released March 9, 1983. (Stock No. 5268)

## Booklets

Making the Most of Our Minerals, 12p. This booklet describes briefly various aspects of the Ontario Mining Industry, and the role of the Ministry of Natural Resources in the Industry. (Stock No. 5825)

Minfacts Issue IV (French Version) (Stock No. 5232-6)

Minfacts Issue V (English Version) (Stock No. 5232)

Minfacts is a periodic newsletter which provides news updates of the Mineral Resources Group's activities and statistics on Ontario's mineral resources.